

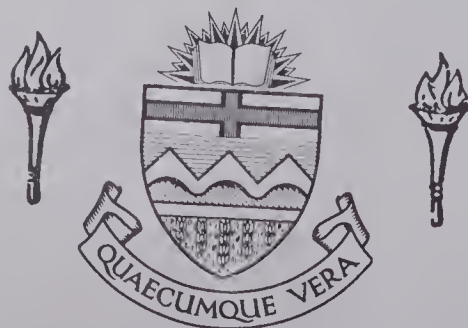
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THE UNIVERSITY OF ALBERTA

MATURITY OF VOCATIONAL ATTITUDES OF STUDENTS
IN VOCATIONAL PROGRAMS

by



GORDON ALBERT SANDERS

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES
IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE
OF MASTER OF EDUCATION

DEPARTMENT OF INDUSTRIAL AND VOCATIONAL EDUCATION

EDMONTON, ALBERTA

SPRING, 1970

142513
1970
115

UNIVERSITY OF ALBERTA
FACULTY OF GRADUATE STUDIES

The undersigned certify that they have read, and
recommend to the Faculty of Graduate Studies for acceptance,
a thesis entitled
..... MATURITY OF VOCATIONAL ATTITUDES OF STUDENTS
..... IN VOCATIONAL PROGRAMS
submitted by GORDON ALBERT SANDERS
in partial fulfilment of the requirements for the degree of
Master of EDUCATION

Abstract

The study was designed to investigate differences in vocational behaviors between groups of vocational students from three high schools: Wagner, Eastglen and Victoria of the Edmonton public school system. The Wagner group, composed of first year students registered in a three year program, had moved from modified grade eight classes of the junior high schools. The Eastglen group had failure scores in grade nine academic subjects but were registered in a certificate program, recently organized, and were in the tenth grade. The Victoria group was in the first year, at the eleventh grade, of a two year vocational-technical program in a comprehensive type high school.

The purpose of the study was to seek answers to:
(a) Are there differences in group levels of maturity of vocational attitudes? (b) Are there differences between male and female subgroup levels of maturity of vocational attitudes? (c) Are there ascending levels of maturity for Wagner to Eastglen to Victoria?

One instrument was used--the Attitude Scale of the Vocational Development Inventory, Crites (1966).

The subjects for the study were drawn at random from the total eligible population of 940. They were 153 vocational students: 49 from Wagner, 35 from Eastglen and 49 from Victoria.

Descriptive statistics, t-tests with tests on variances and one-way analysis of variance were used to compare between-group and within-group levels of maturity of vocational attitudes. To compare group scores and Iowa group scores, which were used to standardize the Attitude Scale, frequency distributions were plotted as cumulative percentage ogives.

The results of the study revealed:

1. With respect to maturity of vocational attitudes, the Wagner first year group and the Eastglen grade nine failure group, particularly males, are generally alike, whereas the Victoria 12/22 vocational-technical group is different. The Victoria group shows more maturity.

2. There is a preponderance of males in the programs. In terms of maturity of vocational attitudes, the range of group levels is wider for males than for females. The females in the programs generally represent a smaller and more homogeneous group.

3. The results of the investigation show ascending levels of maturity of vocational attitudes for Wagner to Eastglen to Victoria. In terms of maturity of vocational attitudes, the groups least ready for the world of work are first year students at Wagner and male students in the first year group at Wagner and in the grade nine failure group at Eastglen. In other words, the academically handicapped student who is leaving the academic stream is least ready to leave school for a vocation.

Acknowledgements

The writer wishes to thank his supervisor Dr. D. Young for his guidance in this study. The constructive comments and supportive attitudes of Dr. J. Paterson and Dr. L. Keim are very much appreciated.

For cooperation in making the study possible, thanks are also extended: to Professor James E. Gallagher; to Dr. E. Hodgson; to Mr. D. Precht of Research Services Division, University of Alberta; to Dr. John O. Crites of the University of Iowa; and to Dr. E. Mansfield of the Edmonton public school district.

Finally, the writer wishes to acknowledge gratitude to his wife and family for agreeing that time could be taken to pursue graduate studies and complete this thesis.

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CHAPTER 1

Introduction

Orientation to the Problem

In the Edmonton public school system vocational education programs developed significantly after 1963, the year that the federal-provincial vocational-technical agreement went into effect in Canada. The first program to be developed in the system was at the senior high school level and was known as the 12-22-32 vocational-technical program (Province of Alberta Senior High School Handbook 1968-69, p. 17). The second program to be developed was the Wagner program which was designed to offer three years of instruction to selected students, most of whom were at eighth grade level. The Wagner program was an outgrowth of a system-wide pre-employment program in the junior high schools. It developed concurrently with a system-wide program for educationally handicapped students in opportunity classes. The grouping of these classes gave rise to a Cairns program associated with a new school (Appendix G). Each of the three programs had its set of objectives and its level of expectations. Each program allowed for movement of students between programs.

The criteria for selection of students for the developing vocational programs related mainly to age and

to academic achievement. For the Cairns program, the age range was twelve to eighteen years and levels of academic achievement were such that students were considered educable--not just trainable. For the Wagner program, the primary criteria for students recommended for the first year of the three year program were age fifteen years and academic achievement such that a student had little probability of succeeding in the regular high school classroom. For the 12-22-32 vocational-technical program in the senior high schools, students under twenty-one years of age could participate on the basis of grade nine provincial examination results in reading, literature, language, social studies, mathematics and science.

The 12-22-32 vocational-technical sequence operated in three of the twelve senior high schools: Harry Ainlay Composite High School, Jasper Place Composite High School and Victoria Composite High School. The relationship of the program to other programs in the senior high schools is described for recent years in Table 1 and Table 2.

In 1968-69 two methods were used by the three senior high schools to offer the vocational-technical program. At Jasper Place Composite High School and at Harry Ainlay Composite High School the course arrangement was 12-22-32, a sequence of three courses for grades ten, eleven and twelve. The credit values were 5, 15 and 15 or 20 respectively, on the basis that one credit represented

TABLE 1

Senior High School Programs, 1967-68

Edmonton Public School System

Admission criteria	Program	School
Graduation from Pre-employment 1, or failed grade IX and 15 years of age or more.	2-year Trades and Services	Jasper Place McKay
A grade IX diploma	3-year Business Clerical (3 BEC) 3-year General (3 G) 3-year Home Economic (3 HE) 3-year Trades and Services (TS)	Victoria (all) Eastglen, Harry Ainlay, Jasper Place, Strathcona (all except TS). McNally, Bonnie Doon, Queen Elizabeth, Ross Sheppard (all except TS and 3 HE).
A grade IX diploma with 4 B's and 2 C's or better.	3-year Business Bookkeeping (3 BEB) 3-year Business Secretarial (3 BES) 3-year Technical (3 T) 3-year Junior Matriculation (3 JM)	Victoria, Jasper Place, Harry Ainlay, (all). Bonnie Doon, Eastglen, McNally, Queen Elizabeth, Ross Sheppard, Strathcona (all except 3 T).

TABLE 1 (continued)

Admission criteria	Program	School
A grade IX diploma with 2 A's and 4 B's or better.	4-year Matriculation (a) Senior Matriculation (4 SM) (b) Business (4 BEM) (c) Fine Arts (4 FAM) (d) Home Economics (4 HEM) (e) Technical (4 TM)	Victoria, Jasper Place, Harry Ainlay (all). Bonnie Doon, Eastglen, McNally, Queen Elizabeth, Strathcona (all except 4 TM). Ross Sheppard (4 SM and 4 BEM only).
A grade IX diploma with 4 A's and 2 B's or better.	3-year Senior Matriculation (3 SM)	All high schools except McKay.

Note.--1. Wagner opened September 1968.

2. Strathcona offered a new Industrial Arts program.

3. Eastglen offered unit shop courses.

4. 4 TM and 3 TM included the 12-22-32 vocational-technical courses and academic courses.

TABLE 2
Senior High Schools, 1968-69
Edmonton Public School System

School	Type of school	Number of credits offered	Enrolment ^a September, 1968
Bonnie Doon	composite	343	1623
Eastglen	composite	443	1273
Harry Ainlay	composite	696	1384
Jasper Place	comprehensive	928	2320
McKay	laboratory	nil	(opportunity classes only)
McNally	composite	346	1189
Queen Elizabeth	composite	423	1567
Ross Sheppard	composite	334	2151
Strathcona	composite	421	1258
Old Scona	semester, academic	40	416
Victoria	comprehensive	1041	2525
W. P. Wagner	academic-vocational	nil	801
			16507

^a Superintendent's report on enrolment, October, 1968.

40 minutes minimum instruction time per week. At Victoria Composite High School the course arrangement was 12/22-32, a sequence of two courses for grades eleven and twelve, for credit values of 20 and 15. For Victoria students the 12/22 courses were preceded by a 10 credit 'general technical orientation program. For students transferring to Victoria from other senior high schools, such as Eastglen Composite High School, the 12/22 course at Victoria was preceded in the home school by 5 or 10 credit unit shop courses or by academic courses only.

Only Victoria offered the 12/22 arrangement of courses to grade eleven students. The courses were in fields such as machine shop, commercial art, graphic arts, automotives, beauty culture and electronics. The students also registered in courses from other in-school programs to carry a normal work load of about 35 credits for one school year.

The Cairns program, the Wagner program and the 12-22-32 vocational-technical program of the senior high schools appeared to be elements of a developing vocational education continuum. Allowing for overlap of programs, the range of these vocational programs was for students who were academically related to: (a) the elementary school program; (b) the junior high school program; and (c) the senior high school program.

Prior to 1967 in the Edmonton public school system,

grade nine failure students were obliged to repeat grade nine or leave school--except at Jasper Place and Victoria schools where they could participate in trades and services programs. In 1967 provincial regulations changed. The school leaving age became sixteen years rather than fifteen years and the failure student was allowed to enter any senior high school.

At Jasper Place the two year trades and services program was in effect the second and third years of a three year program of the Jasper Place community. The first year was the pre-employment program of the neighbouring junior high schools. Grade nine failure students could enter the second year of the three year program.

At Victoria the three year program was designed for students with low stanine rankings who obtained grade nine diplomas. In the 1966-67 school year 72 students who had not obtained diplomas were admitted to the program on an experimental basis. These students were given the opportunity to find places in a comprehensive type school. In succeeding years such students gained admission on a priority basis--if places were available in the school.

In September 1968 the Eastglen Composite High School offered a program to the grade nine failure-low stanine pass group. The program was entitled "certificate program" and was developmental in nature. This was the initial

major attempt in the Edmonton public school system to design a specific program for this group of students. Included in the program were courses in social studies, mathematics, science, English, business education, home economics, automotives and woodwork.

The grade nine failure student was identifiable. He or she earned stanine 1 or 2 rankings, the equivalent of a D standing in a majority of grade nine subjects, as described in the stanine-letter distribution chart (Appendix B). On the basis of the 1966 chart which indicates that eleven per cent of the grade nine student population failed, and not including a Wagner population which was mainly from eighth grade classes, the 1968-69 failure group in a district grade nine population of 6500 students was in excess of 700 students.

Subsequent to the changes in age and entry regulations, the Eastglen Composite High School was the first of district senior high schools to conduct a major experimental program for the failure group. These actions were prompted in part by the availability of its shops. The shop and laboratory facilities at Eastglen were smaller and much less diversified than those of Jasper Place and Victoria. Despite these apparent handicaps the school entered upon a serious attempt to study the characteristics of the grade nine failure-low stanine grade nine pass group in an effort

to design an acceptable program in terms of courses, of methods, and of facilities--possibly new facilities.

The experiment at Eastglen has implications for the school district. In addition to changing the role of the school in its community, the experiment may result in a fourth vocational program for students in the Edmonton public school system, particularly for those students who have been known as the grade nine failure students.

To some extent in 1963, program development was motivated by availability of federal funds and the expressed desire to bridge gaps between schools and jobs. The task of relating school experiences to the world of work has continued with the programs, but the emphasis has now shifted from the program to the individual in the program. Such a shift in emphasis is supported in a study cited by Ray:

In a series of essays, Super and others (1963) have given an overview of the process by which research efforts have led to the proposition that an individual, in seeking an occupation, is at the same time seeking to implement a self-concept. Super and associates have evolved a vocational development which should be useful to individuals who are implementing the curriculum concepts which incorporate occupational education into the experience of all students. In this setting it will be readily noted that vocational education aims for more than providing manpower for the economy (Ray, 1968, p. 320).

Purpose of the Study

Through the years of experimental program experience

and general program development the district produced three levels of vocational programs. As groups of students were identified and described the programs developed to meet expressed needs. The programs are known as 12-22-32 vocational-technical, Wagner and Cairns.

The grade nine failure group of students is now being described by the school system. Vocational program development for these students has commenced. As one aspect of the new field, the study reported here was designed to investigate levels of maturity of vocational attitudes of selected groups of students from the Wagner program, from the Eastglen grade nine failure group and from the 12/22-32 vocational-technical program at Victoria. The groups consisted of first year students in each program and were selected because of their relationships with the academic sequence of eighth grade, ninth grade and tenth grade.

For curriculum development purposes at Eastglen it was important to investigate maturity levels of vocational attitudes of each group and subgroup of the study. It was of interest to compare maturity levels so that an additional element of judgement could be used in program planning. The Eastglen program was in the early stages of development whereas the other two programs had been operational more than five years.

The major objective of the study was to determine

differences in maturity of vocational attitudes of selected student groups from three high schools (Wagner, Eastglen and Victoria) of the Edmonton public school system. By collecting data on levels of maturity of vocational attitudes, implications might be extrapolated for further research--particularly with respect to curriculum development.

Need for the Study

In 1968 and preceding years the grade nine failure group in Alberta was eleven per cent of all students who wrote provincial grade nine academic examinations. This group was all students who were assigned stanine ranks 1 and 2, as described in the information pamphlet of the Department of Education (Alberta Junior High School Handbook, 1962). The failure group did not include students, such as Wagner students, who had not attempted grade nine and who probably would not attempt grade nine.

Since 1967 the status of the grade nine failure group has changed. Members of the group must remain at school until age sixteen rather than age fifteen, and without repeating grade nine they may proceed from the junior high school to the senior high school.

The long term effects of these changes are not fully known. Although special reports go from the school to the Alberta Department of Education as requested in the Senior High School Handbook (1968-69, p. 33) there is little

evidence as yet that senior high schools have holding power for these students. It is difficult to say with confidence that such students can successfully seek course patterns on an individual basis in any senior high school, or whether such students should be treated as a group for program development.

In view of the circumstances surrounding the grade nine failure group of students, it appears imperative that research efforts be directed toward investigation of maturity of vocational attitudes information which could be used in vocational program development.

Definitions of Terms

The following definitions relate to terms as they are used in the study:

Directory. This is the formal list of names of students prepared in the fall by the school.

Pre-employment program. This was a terminal type program designed to prepare students to enter employment.

Modified program. This was a program for grades seven and eight students which provided a smaller student teacher ratio and more overt activities than in the regular classroom.

Disadvantaged students. These were students with marked educational, social and/or economic handicaps (Parsons, 1967).

Vocational maturity (VM). This is the place reached on the continuum of vocational development from exploration to decline (Super, 1955, p. 153).

In his discussion with respect to research which has been conducted on the Attitude Scale, Crites also defined vocational maturity.

The Attitude Scale was developed from a model for the measurement of vocational maturity (Crites, 1961) which was predicated upon two propositions. First, it was reasoned that such a measure should combine the best features of the age- and point-scale models of test construction which had been used in the assessment of intelligence Second, it was argued that any measure of a developmental variable should be systematically (either linearly or monotonically) related to time. What these two precepts implied for the construction of the Attitude Scale was that its items had to be (1) conceptually and linguistically meaningful in terms of contemporary definitions of vocational maturity and (2) functionally and significantly related to age and/or grade groupings. This approach to test construction, which was conceived to eliminate the "surplus meaning" of rationally devised instruments and the theoretical meaninglessness of empirically devised scales, was subsequently referred to as the rational-empirical method (Crites, 1965a). That the Attitude Scale approximates the desiderata stipulated by the model for the measurement of vocational maturity can be judged from the empirical findings which have been gathered on it. Because of the manner in which it was standardized, it is comprised only of items whose content is both genotypically and phenotypically relevant to the concept of vocational maturity and which are monotonically related to grade. Furthermore, research on its "content" validity as determined by judges and its relationships to other variables suggests that the Attitude Scale has some salience and usefulness as a measure of at least one aspect of vocational maturity, viz., the dispositional response tendencies associated with career decision-making (Crites, 1969, pp. 70-71).

The vocational maturity score. The total score on the 50 item attitude test of the Vocational Development

Inventory (VDI) is the vocational maturity (VM) score.

Concept of vocational maturity. This is more comprehensive than vocational choice, including not only the selection of an occupation but also attitudes toward decision making, comprehension and understanding of job requirements, planning activity and ability and development of vocational capabilities (Crites, 1965a, p. 4).

Verbal vocational behaviors. These are verbally expressed vocational behaviors (Crites, 1965a, p. 27).

Attitude Scale. The instrument constructed by Crites as a standardized measure of vocational maturity is:

the Vocational Development Inventory, which consists of two parts--the Competence Test and the Attitude Scale (Crites, 1964). The former, which is designed to assess the cognitive components of vocational maturity, has not been completed; the latter, which is intended to operationally define the conative elements in vocational maturity, has been extensively investigated over the past eight years in a variety of studies (Crites, 1965b) (Crites, 1969, p. 89).

The Attitude Scale, as an approach to the measurement of vocational maturity, defines only one aspect of the more comprehensive construct of vocational maturity. In addition to vocational choice attitude, the construct "encompasses such other variables as choice competencies, choice consistency, and choice realism (Crites, 1969, p. 75)." Four aspects of the construct of vocational maturity are illustrated in Figure 1. The vocational choice attitudes aspect is crucial to the study. It was the Attitude Scale pertaining to it that was used in the study.

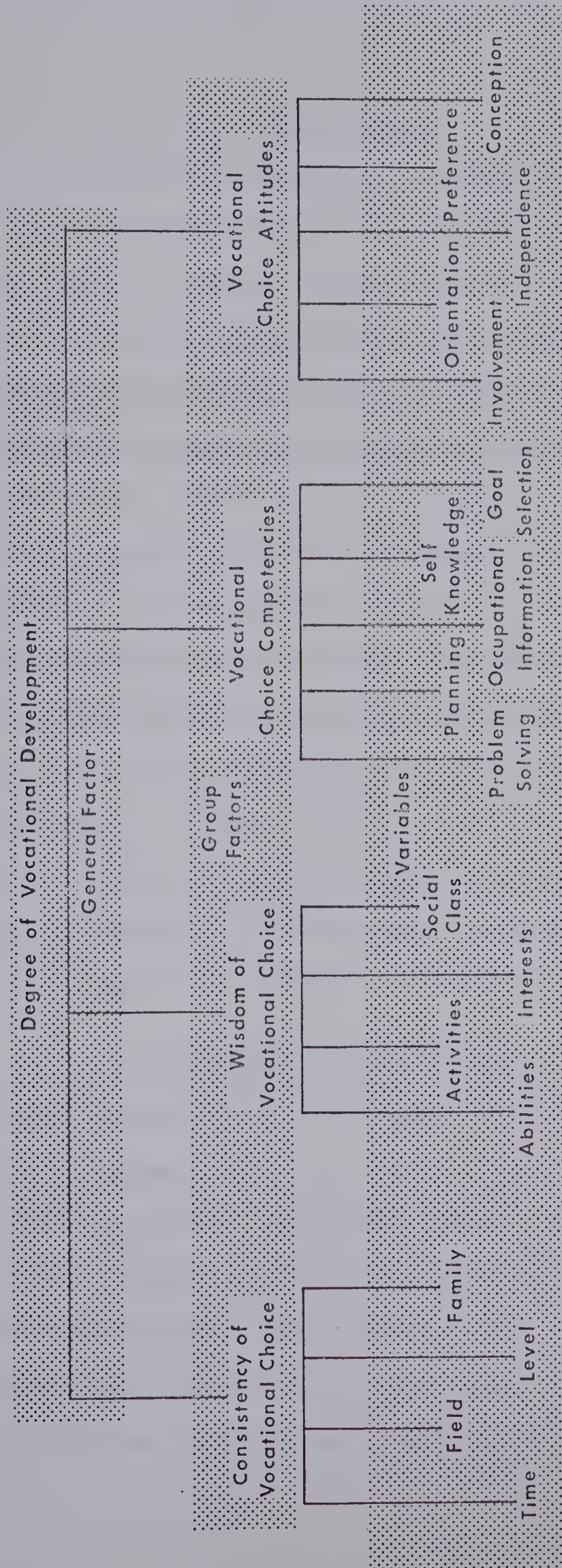


Fig. 1. The construct of vocational maturity (Crites, 1969, p. 76).

Instrument

The instrument used in the study was the Attitude Scale of the Vocational Development Inventory, copyrighted, 1966, by John O. Crites, The University of Iowa. It was form IV: for research purposes only, a booklet which contained fifty statements about occupational choice and work. The answer sheet was side 1 of form number 1501 research edition, Vocational Development Inventory.

The instrument was used because it was standardized and employable for measuring maturity of vocational attitudes of adolescent students. On the basis that "verbal vocational behaviors are monotonically related to both age and grade, but more frequently associated with the latter than the former; (Crites, 1965, p. 1)," the instrument was considered useful for making comparisons of maturity levels of groups of students in different and mainly non-graded first year vocational programs of secondary schools.

Population and Sampling

The population for the study was 940 students of particular programs from three high schools of the Edmonton public school system. The three schools were: W. P. Wagner High School, Eastglen Composite High School and Victoria Composite High School. The schools, three of twelve senior high schools, were selected because they offered, in addition to other programs, first year programs of a vocational or

vocational-technical nature to students considered to have respective academic backgrounds of eighth grade, ninth grade and tenth grade.

The Wagner group. This group was all first year students listed in the 1968 fall directory of the W. P. Wagner High School. The number was 379. The students were described by the school as having an eighth grade background.

The Wagner sample. This was 49 of 50 students who were randomly selected from the Wagner group of 379 ($N=49$). The sample was selected through application of a set of 50 numbers received from the computer on a sequentially numbered directory of 379 names. One of the 50 students selected decided not to participate.

The Eastglen grade nine failure group. The group was all grade nine failure students listed in the 1968 fall directory of the certificate program of Eastglen Composite High School. The number was 36.

The Eastglen grade nine failure sample. As for the group, the sample was all the students, except that one of 36 students elected not to participate ($N=35$).

The Eastglen grade nine pass group. This group was the other section of the Eastglen certificate program group. Its members had stanine rankings of 3 or 4 and low marks in mathematics or science. The number was 106.

The Eastglen grade nine pass group sample. This was

the sample of 20 students which was randomly selected from the Eastglen grade nine pass group of the certificate program (N=20). This sample was used in the study to more precisely describe the grade nine failure group.

The Victoria group. This group was all students listed in the 1968 fall directory of the 12/22 vocational-technical program of Victoria Composite High School. The number was 419. The students were described by the school as having tenth grade backgrounds.

The Victoria sample. This was 49 of 50 students who were randomly selected from the Victoria group of 419 (N=49). The random selection was done in the same manner as for the Wagner sample. One student did not participate.

940 students were listed in the directories associated with the study. 153 of 156 randomly selected students responded positively (N=153).

Research Questions

The study sought answers to six primary questions:

1. Is there a significant difference in levels of maturity of vocational attitudes (VM) between the Eastglen grade nine failure group and the Eastglen grade nine pass group?

2. Is there a significant difference in levels of maturity of vocational attitudes (VM) between groups: Wagner and Eastglen failure, Wagner and Victoria and Eastglen failure and Victoria?

3. Is there a significant difference in levels of maturity of vocational attitudes (VM) between subgroup males: Wagner and Eastglen failure, Wagner and Victoria and Eastglen failure and Victoria?

4. Is there a significant difference in levels of maturity of vocational attitudes (VM) between subgroup females: Wagner and Eastglen failure, Wagner and Victoria and Eastglen failure and Victoria?

5. Is there a significant difference in levels of maturity of vocational attitudes (VM) between males and females of: the Wagner group, the Eastglen failure group and the Victoria group?

6. Is there a significant difference in levels of maturity of vocational attitudes (VM) between Edmonton groups and Crites' Iowa project groups: Wagner and grade nine, Eastglen failure and grade ten and Victoria and grade eleven?

To answer these questions, sixteen hypotheses in six sets were formulated. They are grouped in Table 3.

Method

At the outset of the study in 1969 random samples were taken from each of the identified groups, except that at Eastglen the entire group of grade nine failure students was included. As indicated in the Testing Events Calendars (Appendix C) the testing phase of the study was May 15 to June 10 for the Eastglen grade nine failure group, May 15 to June 12 for the Eastglen grade nine pass group, May 20

TABLE 3
Hypotheses to be Tested

$H_1 : VM_{E(F)} = VM_{E(P)}$	$H_{5.1} : VM_{Wm} = VM_{Wf}$
$H_{2.1} : VM_W = VM_{E(F)}$	$H_{5.2} : VM_{E(F)m} = VM_{E(F)f}$
$H_{2.2} : VM_W = VM_V$	$H_{5.3} : VM_{Vm}^a = VM_{Vf}^b$
$H_{2.3} : VM_{E(F)} = VM_V$	$H_{6.1} : VM_W = VM_{C9}$
$H_{3.1} : VM_{Wm} = VM_{E(F)m}$	$H_{6.2} : VM_{E(F)} = VM_{C10}$
$H_{3.2} : VM_{Wm} = VM_{Vm}$	$H_{6.3} : VM_V = VM_{C11}^c$
$H_{3.3} : VM_{E(F)m} = VM_{Vm}$	
$H_{4.1} : VM_{Wf} = VM_{E(F)f}$	
$H_{4.2} : VM_{Wf} = VM_{Vf}$	
$H_{4.3} : VM_{E(F)f} = VM_{Vf}$	

Note.--The hypotheses refer to the groups: Wagner (W), Eastglen failure (E(F)), Eastglen pass (E(P)), and Victoria (V) in Edmonton, and to Crites' grade nine, grade ten and grade eleven of the Iowa project.

^aMaturity of vocational attitudes of males of the Victoria group.

^bMaturity of vocational attitudes of females of the Victoria group.

^cMaturity of vocational attitudes of Crites' Iowa project grade eleven group.

$p < .05$

to July 9 for the Wagner group and May 15 to July 9 for the Victoria group.

80.12% of the selected students were at school when tested. 19.88% of the selected students were not in attendance at school. For this latter group a follow-up procedure was implemented: 14.74% were tested at homes of students, 1.92% were tested by telephone interviews, 1.29% were tested through use of registered letters and 1.92% decided not to participate. A replacement pool of students was not used because normal conditions of a follow-up procedure were being observed.

Data were collected on the answer sheets for the testing instrument, the Attitude Test of the Vocational Development Inventory (Crites, 1966). In July, 1969 the answer sheets were scored and a data deck was punched at the University of Iowa. The data deck was received in August, 1969 and then analysed through use of the IBM 360/67 computer at the University of Alberta. Statistical analysis pertained only to sample returns: 49 of 50 for the Wagner sample, 35 of 36 for the Eastglen grade nine failure sample, 20 of 20 for the Eastglen grade nine pass sample, and 49 of 50 for the Victoria sample.

The submissions to the computer commenced August 18 and terminated September 27, 1969. The submissions were on a progressive and developmental basis: (a) descriptive

statistics, (b) t-tests with tests on variances and (c) one-way analysis of variance. The descriptive statistics provided an overview with respect to means and standard deviations and probable relationships of between-group vocational maturity levels. The remaining statistics provided answers to the research questions. They also provided for the withdrawal of the Eastglen grade nine pass group from the study so that attention could be focused on the Eastglen grade nine failure group rather than on the Eastglen certificate program group.

Scope and Assumptions

The study was limited to three first year groups of vocational students selected from high schools in the Edmonton Public School District. For reasons with respect to time and resources available to collect data, no attempt was made to extend the study beyond the District to groups in other districts of the Province of Alberta. For similar reasons, groups in other high school programs were not included in parallel studies. For purposes of the study: the Wagner program did not extend beyond the W. P. Wagner High School; the Eastglen grade nine failure program was unique for the district; and the 12/22 program design was offered only at Victoria Composite High School.

The study was based on the assumption that "maturity of vocational attitudes could be objectively and reliably

measured within the Attitude Scale of the Vocational Development Inventory (Crites, 1969, p. 70)." On this basis it was considered possible to make meaningful comparisons of groups and sub-groups: (a) which had become detached from the regular academic program and (b) which were in programs associated with different schools of the same school district.

In view of the major objective of the study, data analysis was for total VM scores only. The phenomenon of the Deviation scale (Crites, 1965a, p. 23) and its relationship to maturity of vocational attitudes was therefore not an aspect of the study. For the same reason, no attempt was made to analyse individual item responses. Because each group was a first year group in an identified vocational program, the age and grade aspects were considered not to be crucial to the study.

To relate the study to the Crites study, total VM scores for Edmonton groups from mainly non-graded situations were compared with total VM scores for Iowa grades five through twelve (Figure 2). It was assumed that comparisons could be made although Alberta norms for the Attitude Scale are not available. On this basis, tentative grade levels could be assigned to the groups of the study, inasmuch as "verbal vocational behaviors are monotonically related to both age and grade, but are more frequently associated with the latter than the former; . . . (Crites, 1965a, p. 1)."

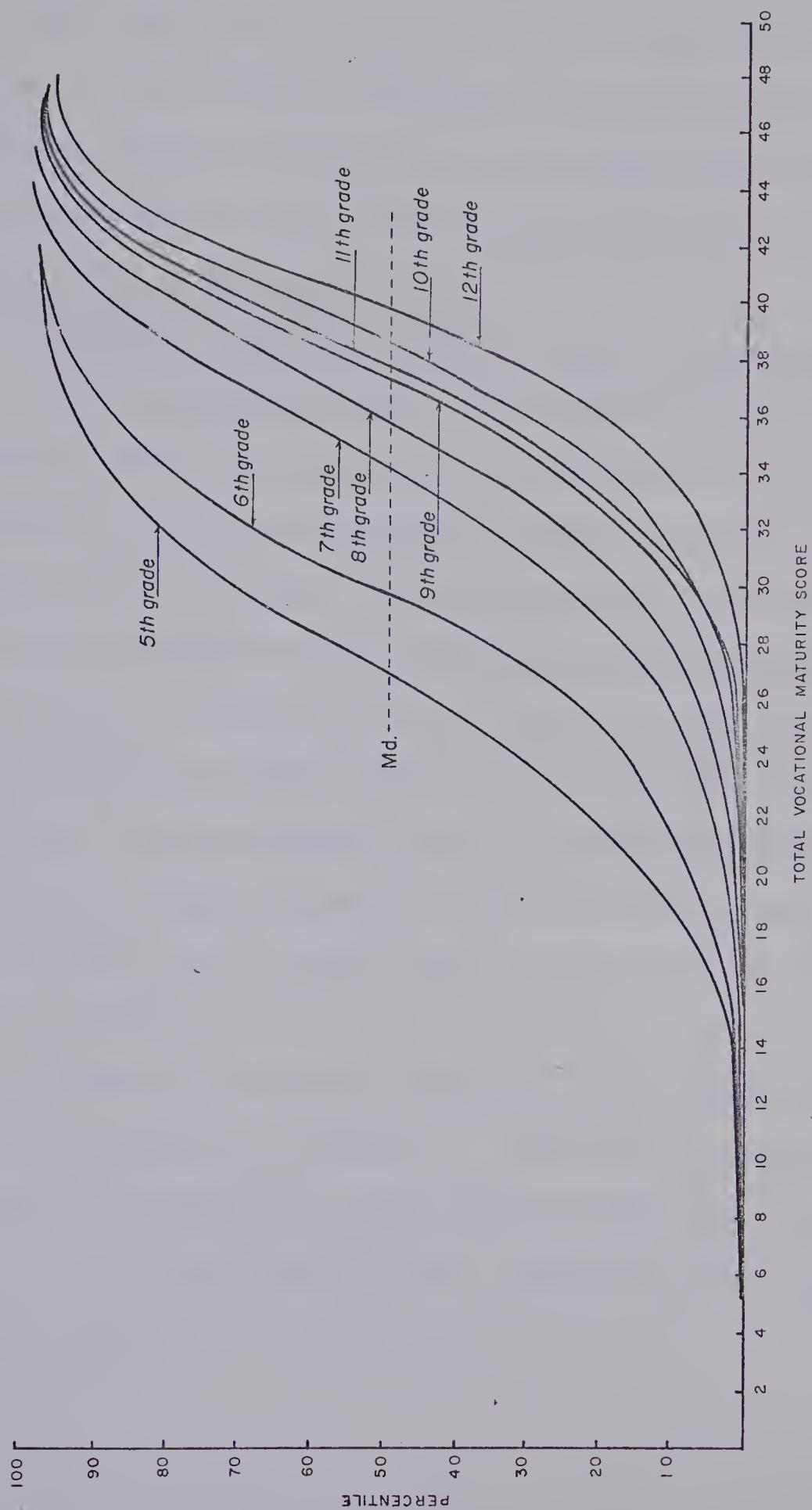


Fig. 2. Cumulative percentage ogives of total VM scores for Grades

5 through 12 (Crites, 1965a, p. 25).

Data Analysis

The study was structured on the major objective. In response to the research questions which related to the objective, sixteen hypotheses in six sets were formulated. Data were collected and analysed and then decisions were made for each hypothesis.

To analyse the data, three computer programs were used: (a) to calculate means and standard deviations and to display observed frequency distributions; (b) to provide "t" values (and their probability levels) between two samples; (c) to provide F ratios (and their probability levels) for the differences between sample variances; (d) to carry out a standard one-way analysis of variance applying the fixed effect model for equal or unequal observations in each group; and (e) Scheffe' multiple comparisons of observed means.. Between-group and within-group analyses were accomplished by use of these selected computer programs.

A review of research literature pertinent to the study is presented in Chapter 2. Research procedures and data analysis methods are described in Chapters 3 and 4. Results of the investigation and conclusions are given in the last chapter.

CHAPTER 2

Review of Related Literature

Included in the review are reports from the literature with respect to vocational development of adolescents and to the processes by which concepts of work are acquired and vocational attitudes are expressed.

Some reports of research describe student groups--particularly disadvantaged groups. The descriptions are in terms of goals and of aspirations and expectations. The inclusion of these reports in the review is on the basis that some of the students of the study may be disadvantaged. The review attempts to describe a contemporary educational setting. Reports of some educational and social factors which may be influencing student levels of aspirations are also presented.

Vocational Development

In a review of educational research, Tennyson indicated:

a growing awareness that occupational motives and behaviors are the result of a complex process of development and experience. Vocational or career development as an area of investigation has been concerned with trying to understand the elaborate socialization process required to transform the child into the working adult . . . (Tennyson, 1968, p. 346).

Tennyson reported a trend to bring the study of career behavior into the mainstream of behavioral science.

He described two current programmatic and longitudinal studies based on the assumption that "long-term vocational behaviors occur within an ordered sequence of life stages in which there is a progression of necessary learning experiences and a mastery of coping techniques (Tennyson, 1968, p. 347)." One of these studies was the 20-year Career Pattern Study by Super and others (1963) which drew upon self-concept theory to provide testable hypotheses regarding the exploratory and decision making process. The other study was by Crites (1965b).

Crites (1965b) is conducting programmatic research on career-oriented behavior. The study, at the University of Iowa, is known as the Vocational Development Project. Crites' study has utilized an

empirical-analytical approach in theorizing about vocational maturity and the interrelationships among various components of this construct. Through extensive cross-sectional sampling, Crites (1965a) managed to develop and standardize readily employable instruments for measuring aspects of vocational behavior (Tennyson, 1968, p. 348).

Assessing Vocational Development

Age and grade are reported as variables used in exploring vocational values and decision making.

Stormer (1967) explored methods of assessing the degree of vocational development of ninth-grade youth. The study disclosed that the vocational development task of crystallizing an occupational preference appears to be

largely a cognitive process consisting of verbal behaviors. An awareness of factors to consider in formulating an occupational preference appeared to develop earlier than the other vocational behaviors studied. There appeared to be a chronological order to the development of the vocational behaviors.

Tennyson reported on the study by Astin (1967a) which compared career choices at ninth grade and twelfth grade. "Among the 26 antecedent variables studied, measured interests and expressed career choice at the ninth-grade level were the best predictors of career outcomes at the twelfth grade (Tennyson, 1968, p. 353)."

Erickson (1967) measured vocational values of ninth-grade students. The value subscales measured altruism, control, job freedom, money, prestige, security and self-realization. The study confirmed findings which are reported to have found relationships between: vocational values and social class identification; educational aspiration and vocational values; achievement and values; and differences between values of males and females. Previous studies reporting relationships between scholastic aptitude and vocational values were not supported.

Lauver (1966) concluded that the measured vocational values of tenth-grade males are not differentiable from those of eleventh-grade males, and that the measured values of all groups of subjects appear unaffected by the

treatments administered to stimulate consideration of certain aspects of career planning.

In his review of educational research, Tennyson (1968) reported the findings of the three following studies which indicated a change in factors associated with decision making at different ages. O'Hara (1962), in a study of fourth-, fifth- and sixth-grade pupils, confirmed the hypothesis that "choices made at this stage of development are more closely related to interests than capacities (Tennyson, 1968, p. 353)." Following eighth graders over a two year period, Gribbons (1964) "found increasing awareness of interests and values and their relation to occupational decisions, along with greater awareness and accuracy of appraisal of abilities (Tennyson, 1968, p. 353)." Contrary to theoretical suppositions that values do not assume an important role in the vocational development of early adolescence, Gribbons and Lohnes (1965) concluded that "value statements even among eighth graders are relatively free of fantasy elements, and remain constant throughout high school (Tennyson, 1968, p. 353)."

These reports suggest a chronological order to the development of vocational behaviors. Reports which follow indicate notes of caution with respect to assuming a consistent age-grade relationship with development of vocational behaviors.

Federoff concluded that:

change between sixth and twelfth grade educational aspirations are positively associated with changes in occupational aspirations. The direction for change of occupational aspirations followed the direction of change for educational aspiration. . . . changes between sixth and twelfth grade educational expectations are positively associated with changes in occupational expectations. The direction of change for occupational expectation followed the direction of change for educational expectation. . . . changes in occupational aspirations are positively related to sex. The direction of change found for all subgroups was that males tended to lower their occupational aspirations while females tended to remain unchanged in their occupational aspirations. . . . changes in educational expectations are positively associated with differences in students' perception of expected achievement in mathematics in sixth grade and perception of attained rank in mathematics in twelfth grade. Generally, the direction of change for perceived expected achievement in mathematics paralleled the changes in educational expectations (Dissertation Abstracts, 1968, 28, 3885-A).

Wendt (1967) studied the nature of the expressed educational, occupational, and personal aspirations of low achieving students and how they differ from other achievement groups of the high schools. He found that:

- (a) lower achieving students have lower I. Q. scores;
- (b) a high percentage of the low achieving students are from families where the father's occupation ranks low;
- (c) low achieving students are more concerned with their lack of skills and ability and poor grades;
- (d) preference of students relative to vocational aspirations is significantly influenced by the achievement levels of the students;
- (e) educational plans of the students were significantly related to their achievement;
- (f) the number of community service aspirations expressed was significantly

related to achievement level; (g) low achievers expressed fewest number of blocks to goals.

Parsons (1967) reported that disadvantaged junior high school students scored markedly below the non-disadvantaged students on the Vocational Development Inventory, Attitude Scale, constructed by Crites (1965a). The disadvantaged students of the study reported that teachers were more understanding and helpful than did the non-disadvantaged students. They also perceived school as easier than did the non-disadvantaged students.

Tennyson concluded that "the level of one's aspirations is contingent to a degree upon opportunities and experiences available within one's frame of social reference (Tennyson, 1968, p. 352)."

Tennyson also found tempered criticisms of vocational development formulations which pointed to the incompleteness of current theory.

Tyler (1967) stated that much of what is being discovered about the stages through which an individual passes in preparing to find his place in the work world cannot be generalized beyond middle-class males. LoCascio (1967) showed how theories of vocational development tend to emphasize the continuous, uninterrupted, and progressive aspects of behavior, and thus appear to have limited significance for the disadvantaged, whose development probably is characterized best as discontinuous. Noting the strict adherence of the theorists to taxonomies based on positive attitudes toward work, Zytowski (1965) proposed that avoidance behavior be studied (Tennyson, 1968, pp. 349-350).

The desire for the formulation of a complete theory

of vocational development has prompted many studies which appear to have served a useful purpose in identifying and describing disadvantaged students.

Contemporary Educational Setting

The following review suggests that curricula should be modified to reflect the pressure of social forces.

Von Schaaf (1966) reviewed the cleavage between vocational and general education in the United States and indicated a need to establish a more compatible union through additional research of the social forces and education. Because of a constantly changing society, the need for continuous assessment of the social forces was apparent. The current implications of the social forces gave indication of the value and worth of the individual in society. The effects of the social forces reflected society's attitude toward the individual. The need to include the worth and value of the individual in educational practices was cited.

Altman (1966) said that a curriculum for basic job technology could serve as a useful bridge between academic discipline and more specific vocational objectives. An attempt to meld the structure of general vocational capabilities to academic content would almost certainly reveal numerous opportunities to enhance the learning and retention of academic knowledge through association with

concrete content. At the other end of the bridge, job technology could facilitate the learning of specific vocational skills and knowledge. Such orderly exposure of the student to the domain of general vocational capabilities would be compatible with the guidance purposes of career choice and effective career planning, and a focal operation for use in career development.

Ray reported that Nathaniel Frank conducted an institute in 1966 on occupational, vocational and technical education. One of the key resultant proposals had reference to a totally new curriculum which would be less dependent on the written and spoken word. Perhaps the most quoted suggestion was that

there be a new vocationally oriented educational path to begin at the junior high level (a) for those who have not benefited from the traditional curriculum, and (b) as enrichment for academically oriented, high-achieving students (Ray, 1968, pp. 311-312).

These studies indicate methods of creating educational climates which may be conducive to vocational development.

Summary

The above review of research literature indicates that many kinds of studies have been conducted to describe vocational development, to assess vocational development in youth, and to describe contemporary educational settings which are presumed to have an influence on youth--

including disadvantaged youth. The movement towards a complete theory of vocational development has apparently stemmed from increasingly creative study designs and the adaptation of statistical tools. In support of these statements Phipps and Evans (1968) argue against opinion surveys and descriptive studies where curriculum needs were inferred and for inclusion of other sources of useful data.

The review indicates recognition of research conducted by Crites. The report of use of the Attitude Scale in Parson's study of disadvantaged students, and the report by Tennyson on the Attitude Scale as an employable instrument suggest that the Vocational Development Project at the University of Iowa is at the forefront of research on career-oriented behavior.

In the following chapter the procedures for the study are presented. The direct relationship of the independent investigator to the Vocational Development Project of Iowa are described.

CHAPTER 3

Procedures

This chapter is organized into seven parts: The Vocational Development Project (Iowa), Programs, The Sample, Data Collection, Sample Returns, Data Processing, and The Eastglen Pass Group. Data analyses are presented in Chapter 4.

The Vocational Development Project (Iowa)

The testing instrument used in the study was developed at the University of Iowa. As exhibited in Appendix A, the Attitude Scale, Form IV, Part I (Crites, 1966) consists of 50 statements about occupational choice and work. The instrument, designed to measure maturity of vocational attitudes, was an outcome of the Vocational Development Project (VDP) of the University of Iowa.

The Vocational Development Project was designed to gather information on the maturity of vocational attitudes of boys and girls at all levels of the educational system, from the elementary grades to the college years. Crites indicated in his open letter that:

the primary purpose of the (Iowa) study is to gain a greater understanding of the decisions which young people make at different stages in their development and how these decisions are related to their subsequent success and satisfaction in work (Appendix A).

In the open letter Crites describes several goals

for the Iowa project:

First, a meaningful and practical inventory of a young person's vocational maturity, which can be used in career counseling, can be constructed and tried out. Second, data on the stages and trends which take place in vocational development over periods of years can be collected and analyzed. Third, the relationships of vocational development, such as the emotional, intellectual, and social, can be investigated. And fourth, the effectiveness of guidance and counseling facilities in the schools can be appraised and possibly increased in light of new facts on how and why students choose occupations as they do (Appendix A).

A request to participate in the Iowa project was made by the investigator to Dr. John O. Crites, director of VDP. In response to the request the investigator received materials for data collection: (a) VDI Attitude Scale, Form IV, (b) VDI Answer Sheet, (c) Instructions Sheet, and (d) VDI Pictorial Schedule. These materials, together with Format 5 and the Card Format Form Sheet, are shown in Appendix A.

The VDI Attitude Scale instrument was administered to students in the months of May, June and July of 1969. The calendar for data collection is reported in Appendix C.

On completion of data collection the answer sheets were forwarded July 7, 1969 to VDP where two data decks were punched. One deck was retained in the VDP data bank at Iowa and the other deck was sent August 5, 1969 to the investigator for data analysis.

The above discussion has outlined the relationship of the Vocational Development Project (Iowa) and the

current study. Based upon results of the analysis for the current study, special developmental tasks may be attempted to facilitate vocational maturity of Eastglen grade nine failure students. Through comparisons of maturity levels of vocational attitudes measured with the Attitude Scale, and through evaluation of programs at Wagner and at Victoria for the respective groups, new approaches may be considered for counseling, for guidance, and for occupational courses at Eastglen. The three programs related to the study are described in the next part of the chapter.

Programs

Atypical programs in three schools of the Edmonton public school system were selected for the study. The three schools were W. P. Wagner High School, Eastglen Composite High School and Victoria Composite High School. The September 1968 enrolment figures were 801 for Wagner, 1273 for Eastglen and 2525 for Victoria.

Description of the Wagner Program at W. P. Wagner High School

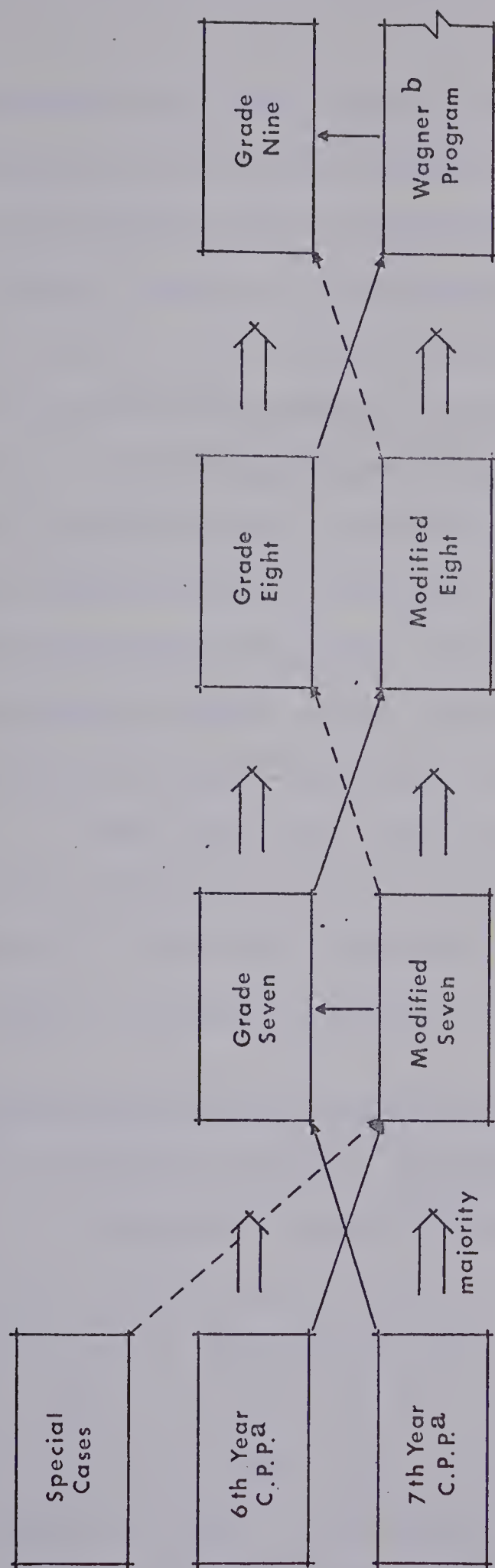
W. P. Wagner High School was designed for the most part for students at a lower level of achievement than the grade nine failure students--namely, students from the modified program of the junior high schools.

The program for W. P. Wagner High School is an outgrowth of the pre-employment program which developed in the junior high schools after 1960. Figure 3 represents articulation procedures for junior high schools and the Wagner program. Articulation is mainly with the modified program and to a lesser extent with the grade seven, grade eight and grade nine sequence.

The heavy arrows indicate the route that the majority of students in a class follow. The medium arrows show routes that are commonly followed in moving from the major route to the modified route or vice-versa. The dotted lines indicate routes which are open to students under special circumstances.

As represented in Figure 3, the main route to the Wagner program is through the modified program and not from grade nine.

Within the Wagner program, W. P. Wagner High School offers a three year vocational-academic program mainly to students who are within a few months of fifteen years of age. The academic half of the program is designed to build upon student experiences in the shops and laboratories of the school. The vocational half of the program provides a series of orientation courses in the first year, a cluster type or departmental type course in the second year and specialization in one major vocational area in the third year. In the first year



^a Continuous Progress Plan.

^b Formerly the pre-employment program.

Fig. 3. Modified Program (Edmonton Public School Board Junior High School Handbook, 1968, p. 5).

students work half days in one departmental shop or laboratory for six or seven weeks and then move to another departmental shop or laboratory. In the second year students select one department in which to work half days all year. In the third year the students stay half days in the same department, but work in one major area. To relate such movements to a departmental setting such as in the automotives department: first year students visit the small engines laboratory; second year students work in the service station, in the parts section and in the automotive repair shop; and third year students select only one of the second year areas for in-depth work.

The population for the study includes all students of the 1968-69 first year group at W. P. Wagner High School. The study excludes first year pre-employment (Wagner Program) students at Hillcrest Junior High School.

Description of the Eastglen Composite High School Program for Grade Nine Failure Students

Eastglen Composite High School offers senior high school courses at the grade ten level, at the grade eleven level and at the grade twelve level. Its facilities provide for courses in the academic field, in business education, in fine arts, in home economics and in industrial arts. Some industrial arts facilities are equipped as shops rather than as laboratories and are

capable of offering vocational courses at the grade eleven 12/22 vocational-technical level.

In addition to other grade ten courses, Eastglen offers a certificate program at the grade ten level for grade nine pass students with stanine rankings of 3 or 4 (Appendix B) and low marks in mathematics or science and for grade nine failure students.

It is relevant to the study to describe general conditions under which grade nine failure students enter Eastglen Composite High School. Since 1967, Alberta students who fail grade nine are able to enter senior high schools without repeating grade nine. At the same time the schoolleaving age has changed from fifteen to sixteen years. When a student enters Eastglen it is known that in terms of the Alberta Senior High School Handbook that:

- (a) if he secures a D standing in any subject, it is very unlikely that he will succeed in the grade ten course in that subject,
- (b) he should select courses which have relationship to his occupational preference, his interests and his abilities,
- (c) he will be granted credits in approved high school courses if recommended by the school, and
- (d) to earn credits attached to any course in the high school program, he must achieve at least a C standing in that course (see Alberta Senior High School Handbook, 1968-69, Sections 3, 5, 8, pp. 32-33).

Eastglen responds to admission requests of grade

nine failure students and groups them with grade ten students who have grade nine stanine 3 or 4 rankings and low marks in mathematics or science. The two groups work together in the Eastglen certificate program.

The study was concerned with the grade nine failure students of the 1968-69 certificate program group.

Description of the Victoria Composite High School 12/22
Vocational-technical Program

The vocational-technical program at Victoria Composite High School operates for the most part on a two-year basis, with the 12/22 vocational-technical courses for grade eleven students and the 32 vocational-technical courses for grade twelve students. The subjects, such as electronics and food preparation, are named in the Senior High School Handbook (1968-69, p. 17) and the objectives for most of the courses are listed in the Alberta Program of Studies (1967).

The 12/22 vocational-technical subjects receive twenty credits as compared with five credits for academic subjects. The participating grade eleven student commits one half of his school year to the 12/22 vocational-technical program and the other half to academic subjects. On successful completion of the 12/22 vocational-technical subject and the school year the student can advance to the 32 vocational-technical level.

A group for the study was all students of the 1968-69 12/22 vocational-technical program at Victoria.

The Sample

Three groups of students were involved initially in the study. A fourth group was added as a control group but later it was withdrawn.

The 1968-69 fall directories of the schools were examined for identification of groups. There were 379 first year students listed for Wagner and 419 12/22 vocational-technical students listed for Victoria. It became evident from the Eastglen directory that only 36 grade nine failure students were listed for the certificate program. The decision was to randomly select 50 of 379 names of the Wagner list, 50 of 419 names of the Victoria list and all of the names from the Eastglen list. In addition, it was decided to use the Eastglen certificate program pass group as a control group for the failure group of 36.

There were 142 names in the certificate program directory for Eastglen: 36 names of grade nine failure students as indicated above and 106 names of grade nine pass students with low marks in mathematics and science. 20 of the 106 names of pass students were randomly selected for the control group.

The control group was identified so that levels of

maturity of vocational attitudes for the two Eastglen 44
subgroups could be compared. Similar levels might indicate
practical identification and selection procedures at the
school and lack of need to retain a control group in the
study. Different levels might indicate need for change
in design of the study in order to accommodate at least
a fourth group.

Sets of random numbers, appropriate for the size of
each group, were received from the computer at the
University of Alberta and then applied to consecutively
numbered group lists. The names of students were thereby
identified for the data collection task: 50 names from
the first year Wagner group, 50 names from the 12/22
vocational-technical Victoria group and 20 names from the
Eastglen pass group. 36 of 36 names were previously
identified in the Eastglen failure group. Table 4 indicates
group data and sample data for males and for females.

Data Collection

As indicated in Table 5, in-school and out-of-school
data collection were required.

Administrative arrangements for in-school data
collection were made with the principals of the schools.
The collection events were organized at Wagner by the
Department Head--Counseling, at Eastglen by the first
assistant principal and at Victoria by two assistant

TABLE 4
Population and Sample

Group	Group data		Sample data	
	Total ^a	Males Females	N	Males Females
Wagner	379	253 126	49	32 17
Eastglen (failure)	36	20 16	35	20 15
Eastglen (pass) ^b	106	60 46	20	13 7
Victoria	419	312 107	49	36 13
Total	940	645 295	153	101 52

^aSchool directory, fall 1968.

^bControl group.

TABLE 5
Data Collection

Sample	At school	At student's home	By telephone	By registered letter	Non- completions	Sample returns
Wagner	40	7	1	1	1	49 of 50
Eastglen (failure)	30	4	1	-	1	35 of 36
Eastglen (pass)	19	1	-	-	-	20 of 20
Victoria	36	11	1	1	1	49 of 50
Total	125	23	3	2	3	153 of 156

principals. The in-school arrangements followed different patterns. At Wagner and at Eastglen large group sittings were held with the investigator present. At Victoria, class sittings were supervised by teachers only. The instructions sheets for administering the testing event were used at each school (Appendix A). At Victoria, where class sittings were supervised by teachers, a memorandum from the assistant principal accompanied the instructions sheets (Appendix A).

The out-of-school testing was done by the investigator on an individual basis by interview, by telephone interview and by registered letter.

The data collection sittings for each sample proceeded where necessary from large group or class to small group to individual and from in-school to out-of-school, as recorded in Appendix C. The sittings commenced in the third week of May, 1969 and terminated in the second week of July, 1969.

Sample Returns

As stated in Table 5, the returns were 49 for Wagner, 35 for the Eastglen failure group, 20 for the Eastglen pass group and 49 for Victoria. These returns constituted the N for subsequent data processing and data analysis.

Data Processing

One hundred fifty one completed answer sheets were forwarded July 7, 1969 to the Vocational Development Project at the University of Iowa. One data deck of three cards per subject was returned to the investigator on August 6, 1969. Two sets of three cards were added to the Iowa deck for two additional returns received from students. To test the composition of the completed deck, listings were run on the accounting machine.

The processing of data was completed at the Research Services Division, Faculty of Education, University of Alberta. The calculations and analyses were accomplished by means of three computer programs as described in Appendix D with the titles: (a) DESCRIPTIVE STATISTICS PACKAGE WITH DATA TRANSFORMATION for calculating means, standard deviations, correlations and ranges; (b) T-TESTS WITH TESTS ON VARIANCES AND WELCH APPROXIMATIONS for t values and F ratios; and (c) ONE-WAY ANALYSIS OF VARIANCE for a standard one-way analysis of variance applying the fixed effect model for equal or unequal observations in each group. Each program was a complete program using the language FORTRAN IV for the first and the language FORTRAN IV(H) for the other two. The machine used was the IBM 360/67.

A battery of data processing machines was used to prepare data sub-decks for submission to the computer.

Object decks, used with the data sub-decks, were received on loan from the Research Services Division for each submission.

The Eastglen Pass Group

In view of the decision to use the Eastglen pass group as a control group for the Eastglen failure group there is need to describe the relationships.

At Eastglen, the pass group students and the grade nine failure students were together in the certificate program. For instructional purposes the two groups were treated as one group.

The sample of grade nine failure students at Eastglen was 36. As the sample was of maximum size, and since it was feasible to select larger samples of 50 at Wagner and at Victoria, it was decided to randomly select a sample of 20 from the pass group at Eastglen. The latter group, identified as the Eastglen pass group, was to be statistically described and then compared with the Eastglen failure group. The purpose of such description and comparison was to determine whether or not the failure group was representative of the certificate program group.

Data analyses for the study are presented in Chapter 4.

CHAPTER 4

Data Analysis

The data is displayed and analysed in six tables and three figures. Table 6 describes the subgroups and samples and indicates relationships in terms of calculated means and standard deviations. Table 7 displays statistics for differences of means between two independent samples at Eastglen and provides the basis for withdrawal of the pass group from the study. Tables 8, 9 and 10 describe relationships between subgroups and samples and within samples for decisions with respect to four sets of hypotheses. Table 11 and Figures 4, 5 and 6 relate the study and the Iowa project. The results of the investigation are discussed in Chapter 5.

Overview

Before developing statistics specifically related to the hypotheses, statistical descriptions of the samples and of the subgroups are examined. Table 6 records means and standard deviations for Wagner, Eastglen failure and Victoria groupings of males, of females and of samples. These statistics were part of the computer output of DESCRIPTIVE STATISTICS PACKAGE WITH DATA TRANSFORMATION. They offer an overview with respect to probable group

TABLE 6

Descriptions of Subgroups and Samples

Group	W vs E(F) vs V				Total ^a
	W	E(F)	V		
	N $\bar{X}(VM)$ s(VM)	N $\bar{X}(VM)$ s(VM)	N $\bar{X}(VM)$ s(VM)	N $\bar{X}(VM)$ s(VM)	
Subgroup (males)	32 30.56 4.96	20 31.60 4.67	36 35.72 5.74	88 32.90 5.67	
Subgroup (females)	17 30.88 4.37	15 33.20 3.96	13 35.38 4.51	45 32.95 4.52	
Samples ^a	49 30.67 4.72	35 32.28 4.39	49 35.63 5.40	133 32.92 5.31	

^aValues from the data.
s: Standard deviation.
VM: Vocational maturity scores.
 \bar{X} : Sample mean.
N: Number of members.

relationships for the study.

The Eastglen Groups

Table 7 is designed for testing Hypothesis 1:

$$VM_{E(F)} = VM_{E(P)}.$$

t values are calculated for t tests between independent samples, with or without missing data. The decision rules are indicated.

Subgroups and Samples

Table 8 contains three probability matrices for Scheffe' multiple comparisons of VM means for subgroups and samples. Each matrix relates specifically to a set of hypotheses of the study:

- | | |
|----------------------------|---------------------------------|
| 1. Samples matrix and | $H_{2.1}: VM_W = VM_{E(F)}$ |
| | $H_{2.2}: VM_W = VM_V$ |
| | $H_{2.3}: VM_{E(F)} = VM_V$ |
| 2. Subgroups (males) and | $H_{3.1}: VM_{Wm} = VM_{E(F)m}$ |
| | $H_{3.2}: VM_{Wm} = VM_{Vm}$ |
| | $H_{3.3}: VM_{E(F)m} = VM_{Vm}$ |
| 3. Subgroups (females) and | $H_{4.1}: VM_{Wf} = VM_{E(F)f}$ |
| | $H_{4.2}: VM_{Wf} = VM_{Vf}$ |
| | $H_{4.3}: VM_{E(F)f} = VM_{Vf}$ |

TABLE 7
Differences of Means for Independent Samples
at Eastglen

Sample	N	VM \bar{X}	VM s	df	t	p-two tail
E(F)	35	32.29	4.33	53	0.029	0.97*
E(P)	20	32.25	4.24			

*p < .05

TABLE 8

Probability Matrices for Scheffe' Multiple Comparisons
of VM Means for Subgroups and Samples

W vs E(F) vs V

Subgroup or sample	W	E(F)	V
Samples			
W	1.0000	0.3352	0.0000
E(F)		1.0000	0.0102
V			1.0000
Subgroups (males)			
W	1.0000	0.7862	0.0005
E(F)		1.0000	0.0223
V			1.0000
Subgroups (females)			
W	1.0000	0.3216	0.0243
E(F)		1.0000	0.4123
V			1.0000

$p < .05$

Analysis of Variance

Table 9 displays analysis of variance results for samples, subgroup males and subgroup females. As a descriptive index of how different one group is from the others, the ONE-WAY ANALYSIS OF VARIANCE program was used to carry out a standard one-way analysis of variance applying the fixed effect model for equal or unequal observations in each group.

Within-group Tests

Table 10 provides statistics to test the set of hypotheses for males versus females of each sample:

$$H_{5.1} : VM_{Wm} = VM_{Wf}$$

$$H_{5.2} : VM_{E(F)m} = VM_{E(F)f}$$

$$H_{5.3} : VM_{Vm} = VM_{Vf}$$

Results of t-tests are recorded for investigation of maturity levels of vocational attitudes. The p-two tail values and decision rule are indicated.

Edmonton and Iowa Groups

The calculations allow comparisons of total vocational maturity scores for groups in Edmonton and Iowa. Two methods are used: (1) the comparison of VM means from t statistic calculations, and (2) the comparison of cumulative percentage ogives. These results are designed to test the last set of hypotheses of the study:

TABLE 9
Analysis of Variance for
Subgroups and Samples
W vs E(F) vs V

Source	SS ^a	MS ^b	df ^c	F ^d	p ^e
Samples					
Groups	0.62200000E 03	311.00	2.	12.92	0.000
Error	0.31293750E 04	24.07	130.		
Subgroup (males)					
Groups	0.49537500E 03	247.69	2.	9.02	0.000
Error	0.23339375E 04	27.46	85.		
Subgroup (females)					
Groups	0.15066797E 03	75.33	2.	4.10	0.023
Error	0.77124609E 03	18.36	42.		

^aSum of squares, or variation.

^bMean square: $\frac{SS}{df}$.

^cDegrees of freedom.

^dA ratio in the form: $\frac{MS_{\text{methods}}}{MS_{\text{error}}}$.

^eProbability

p < .05.

TABLE 10
 t Tests for Males vs Females in the Wagner Sample,
 in the Eastglen Sample, and in the Victoria Sample

Sample	Males VM \bar{X}	Females VM \bar{X}	Males VM s	Females VM s	N	df	t	p-two tail
W	30.56	30.88	4.89	4.24	49	47	-0.223	0.82*
E(F)	31.60	33.20	4.55	3.83	35	33	-1.068	0.29*
V	35.72	35.38	5.66	4.34	49	47	0.191	0.84*

*p < .05.

$$\begin{aligned}
 H_{6.1} &: VM_W = VM_{C9} \\
 H_{6.2} &: VM_{E(F)} = VM_{C10} \\
 H_{6.3} &: VM_V = VM_{C11}
 \end{aligned}$$

The results of t statistic calculations and the decision rule are shown in Table 11. The calculations for developing cumulative percentage ogives for the Edmonton groups are based upon output tables of the DESCRIPTIVE STATISTICS PACKAGE WITH DATA TRANSFORMATION. The data for the calculations are provided in Appendix E. For comparison purposes the ogives are separately superimposed on Figures 4, 5 and 6 (Crites, 1965a, p. 25):

Wagner versus Iowa grade 5 through 12,
 Eastglen (failure) versus Iowa grade 5 through 12, and
 Victoria versus Iowa grade 5 through 12.

Analysis of data pertaining to the hypotheses was set forth in Chapter 4. The results of the investigation and the conclusions are presented in Chapter 5.

TABLE 11
Comparison of VM Means--Edmonton and Iowa Groups

Groups	N	VM \bar{X}	VM s	t
W	49	30.67	4.67	8.20*
C ₉ ^a	703	36.50	4.82	
E(F)	35	32.29	4.33	6.65*
C ₁₀ ^a	213	37.81	4.58	
V	49	35.63	5.35	1.87*
C ₁₁ ^a	131	37.16	4.72	

Note.--See Appendix E for t statistic calculations.

^a(Crites, 1965a, p. 24).

*p < .05.

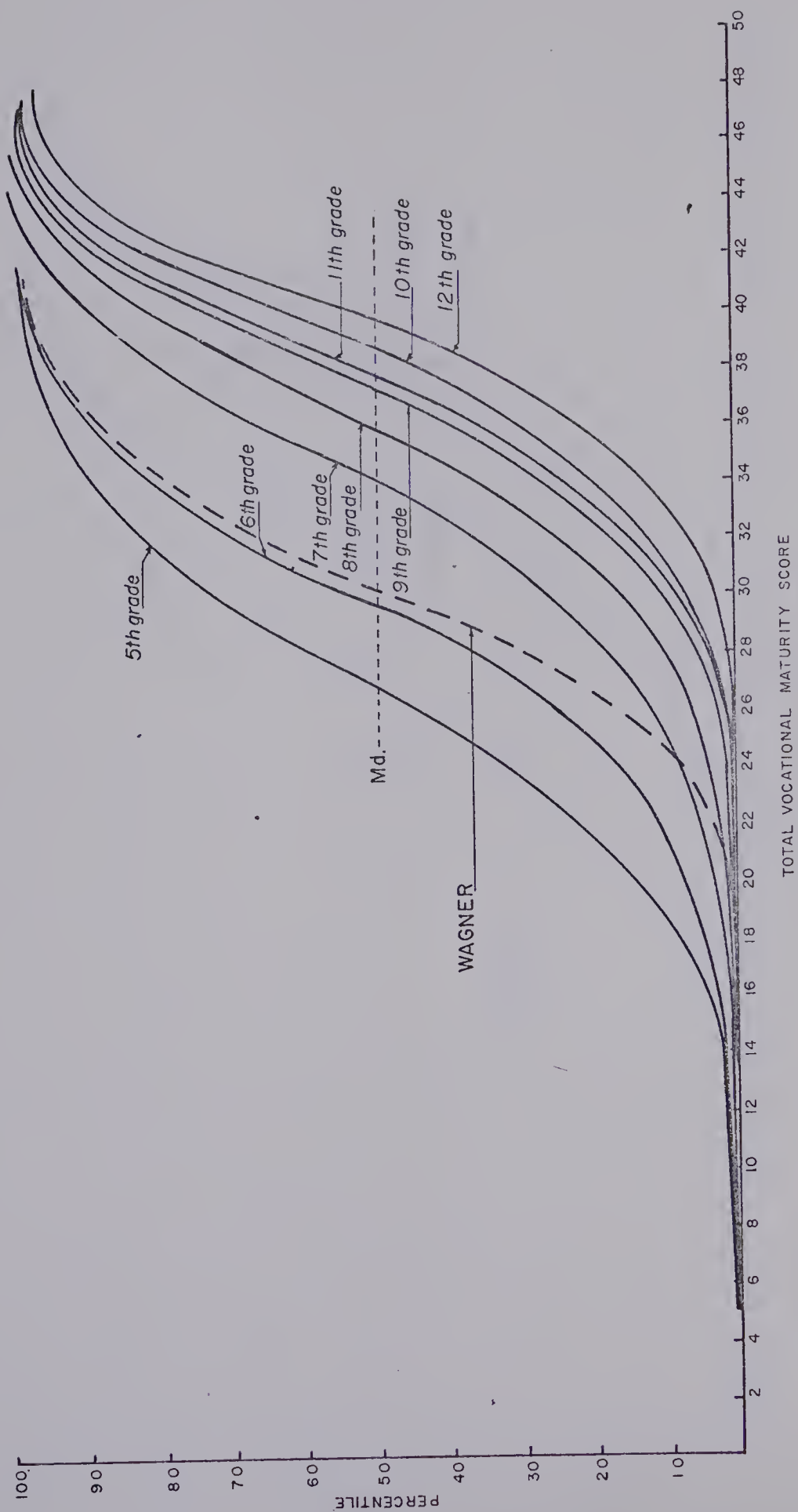


Fig. 4. Cumulative percentage ogives of total VM scores for Wagner vs Iowa (Crites, 1965a, p. 25) grades 5 through 12.

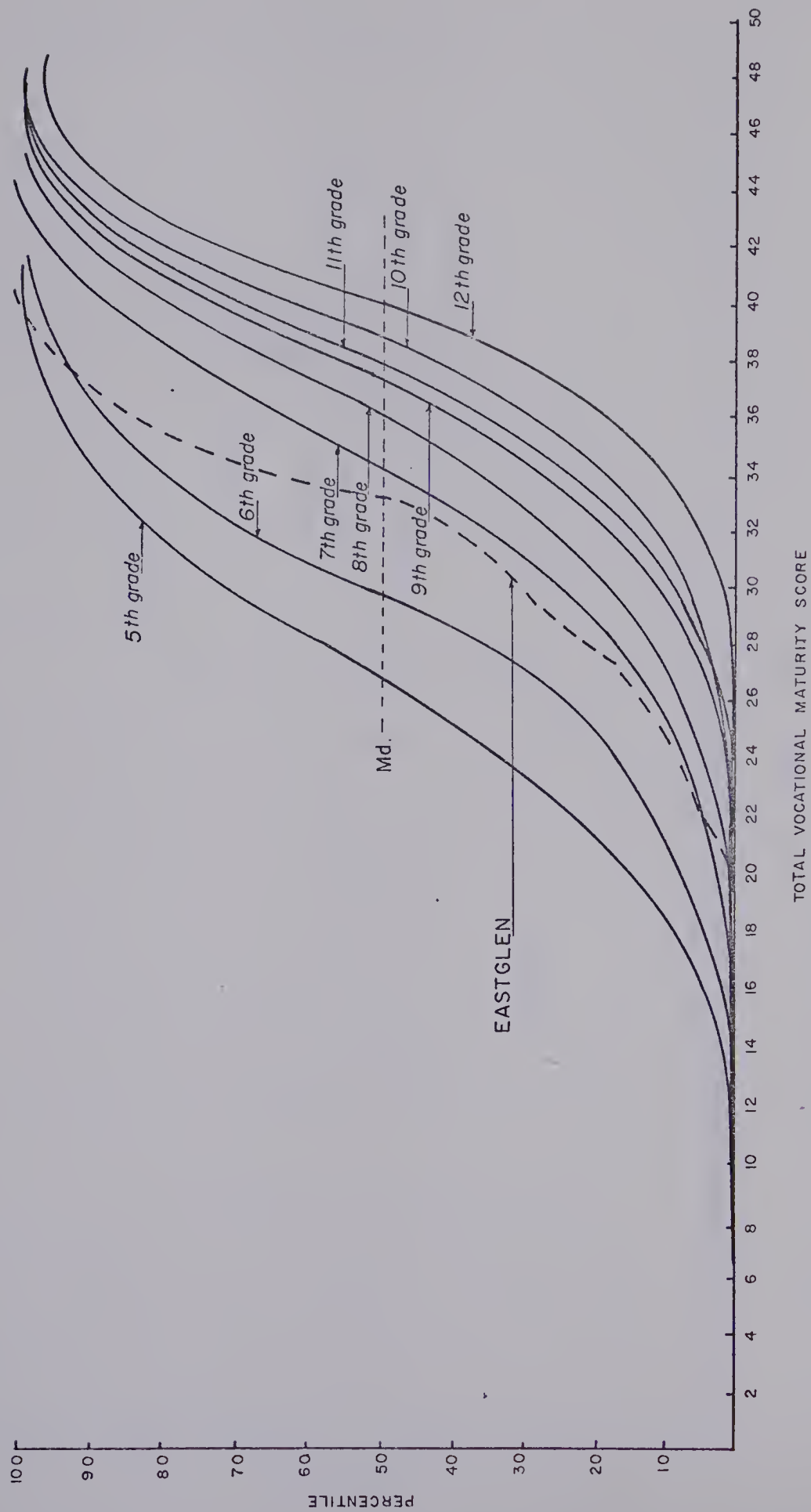


Fig. 5. Cumulative percentage ogives of total VM scores for Eastglen (failures) vs Iowa (Crites, 1965a, p. 25) grades 5 through 12.

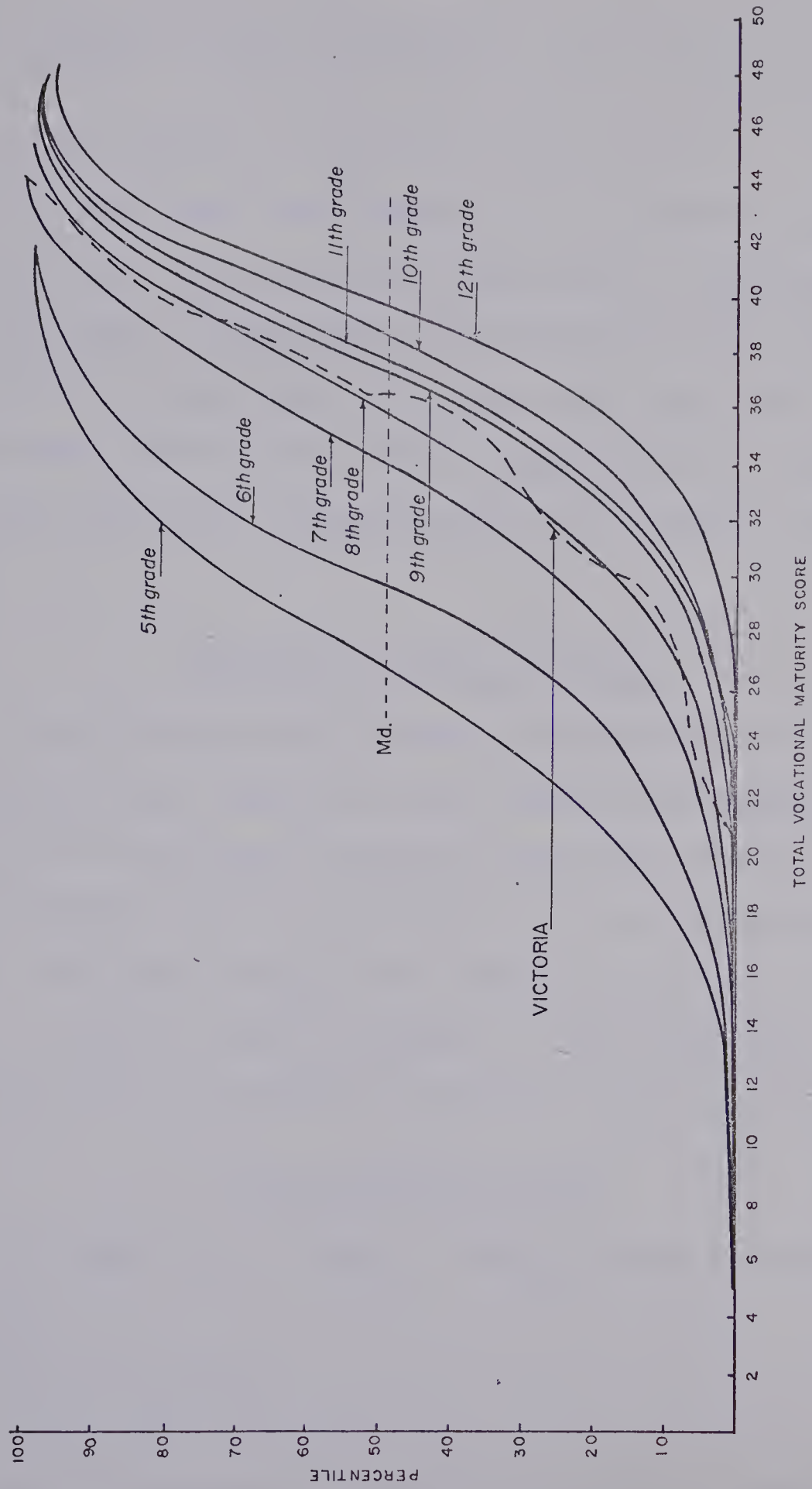


Fig. 6. Cumulative percentage ogives of total VM scores for Victoria vs Iowa (Crites, 1965a, p. 25) grades 5 through 12.

CHAPTER 5

Results of the Investigation and Conclusions

This chapter is organized into ten parts. The first six parts interpret the results of the analysis presented in Chapter 4. They also give decisions of rejecting or not rejecting the hypotheses which operationally define the purpose of the study. The last four parts put forth conclusions based on the study, suggestions for improvement of study design and recommendations for further investigations.

Methods of Interpretation

The decisions with respect to hypotheses are based on a significance level of .05. Using the decision rule of .05 and appropriate critical values for each set of data in Tables 6 to 11, decisions for the hypotheses are stated. They are grouped for reference purposes in Tables 12, 13, 14 and 15, and in Figure 7. The hypothesis concerning the two Eastglen groups is treated separately.

The Eastglen Groups

To test $H_1 : VM_E(F) = VM_E(P)$ data were selected from Table 7:

df of 53, and

p-two tail value of 0.97.

For 53 degrees of freedom a t equal to 2.008 is

required for significance at the .05 level. Because the calculated value is 0.97, which is less than 2.008, there are no adequate grounds for rejecting the hypothesis. The decision is to accept the hypothesis.

On this basis the Eastglen pass group was withdrawn from the study. There was no significant difference at the .05 level between the two Eastglen groups.

Results of Comparisons of VM Means

Calculated values were arranged in Table 8 for Scheffe' multiple comparisons of VM means. By relating these values which range from 0.0000 to 1.0000 and the critical value-level of significance value 0.05, decisions are made with respect to three sets of hypotheses. The calculated value for each comparison of VM means indicates the degree of association between VM means. Decisions are recorded in Table 12.

Results of One-way Analysis of Variance

Decisions in Table 12 are generally supported by decisions in Table 13. For one-way analysis of variance results, significant differences at the .05 level exist between samples, between male subgroups and between female subgroups. Based on F ratio values the greatest difference is between samples and the least difference is between female subgroups.

TABLE 12

Results of Analysis for Samples and Subgroups

Hypothesis	Probability value*	Decision
Samples		
$H_{2.1}^a: VM_W^b = VM_{E(F)}^c$	0.3352	accept
$H_{2.2}: VM_W = VM_V$	0.0000	reject
$H_{2.3}: VM_{E(F)} = VM_V$	0.0102	reject
Subgroups (males)		
$H_{3.1}: VM_{Wm} = VM_{E(F)m}$	0.7862	accept
$H_{3.2}: VM_{Wm} = VM_{Vm}$	0.0005	reject
$H_{3.3}: VM_{E(F)m} = VM_{Vm}$	0.0223	reject
Subgroups (females)		
$H_{4.1}: VM_{Wf} = VM_{E(F)f}$	0.3216	accept
$H_{4.2}: VM_{Wf} = VM_{Vf}$	0.0243	reject
$H_{4.3}: VM_{E(F)f} = VM_{Vf}$	0.4123	accept

Note.--Hypotheses refer to E(F), W, and V.

^aHypothesis 2.1.

^bMaturity of vocational attitudes of Wagner first year group.

^cMaturity of vocational attitudes of Eastglen failure group.

* $p < .05$.

TABLE 13
Results of Analysis of One-way Analysis of Variance
for Samples and Subgroups

Group	F	Critical value	Decision
Samples	12.92	3.07 ^a	significant difference
Males	9.02	3.11 ^b	significant difference
Females	4.10	3.22 ^c	significant difference

^aF.95(2,130) = 3.07

^bF.95(2,85) = 3.11

^cF.95(2,42) = 3.22

Results of Within-group Tests

As indicated in Table 14 the data do not contradict the hypotheses for .05-level tests.

The Edmonton and Crites' Groups

Two methods were used to compare VM means: (a) the calculating of t values, and (b) the calculating for cumulative percentage ogives. For .05-level tests indicated in Table 15, the data do contradict hypotheses 6.1 and 6.2. For hypothesis 6.3, the data do not contradict. In Figure 7 three cumulative percentage ogives are superimposed on Figure 4 (Crites, 1965a, p. 24). These results which are expressed graphically show an alignment of ogives: above Crites' sixth grade and Wagner first year group; below Crites' seventh grade and Eastglen failure group; and Crites' ninth grade and Victoria.

Both methods of comparing means indicate a level for Wagner below the level for Crites' grade nine and a level for Eastglen below the level for Crites' grade ten. For Victoria, one method indicates a level of Crites' grade eleven and the other method a level of Crites' grade nine. This discrepancy is probably explained in a statement of Crites: "As its ogives show in Figure 4, the eleventh grade in this sample was atypical, since it was less like the twelfth grade in its VM score (Crites, 1965a, p. 25)." Figure 7 shows a small difference between ninth grade and

TABLE 14
Results of Within-group Tests
(t tests for males vs females)

Hypothesis	p-two tail value	Critical value	Decision
$H_{5.1}: VM_{Wm} = VM_{Wf}$	0.82	2.014	accept
$H_{5.2}: VM_{E(F)m} = VM_{E(F)f}$	0.29	2.036	accept
$H_{5.3}: VM_{Vm} = VM_{Vf}$	0.84	2.014	accept

$p < .05$

TABLE 15
Results of Comparisons of VM Means: Wagner vs Crites' Grade 9 Group,
Eastglen (failure) vs Crites' Grade 10 Group,
and Victoria vs Crites' Grade 11 Group

Hypothesis	t	Critical value	Decision
$H_{6.1}: VM_W = VM_{C9}$	8.20	1.96	reject
$H_{6.2}: VM_E(F) = VM_{C10}$	6.65	1.96	reject
$H_{6.3}: VM_V = VM_{C11}$	1.87	1.96	accept

$p < .05$

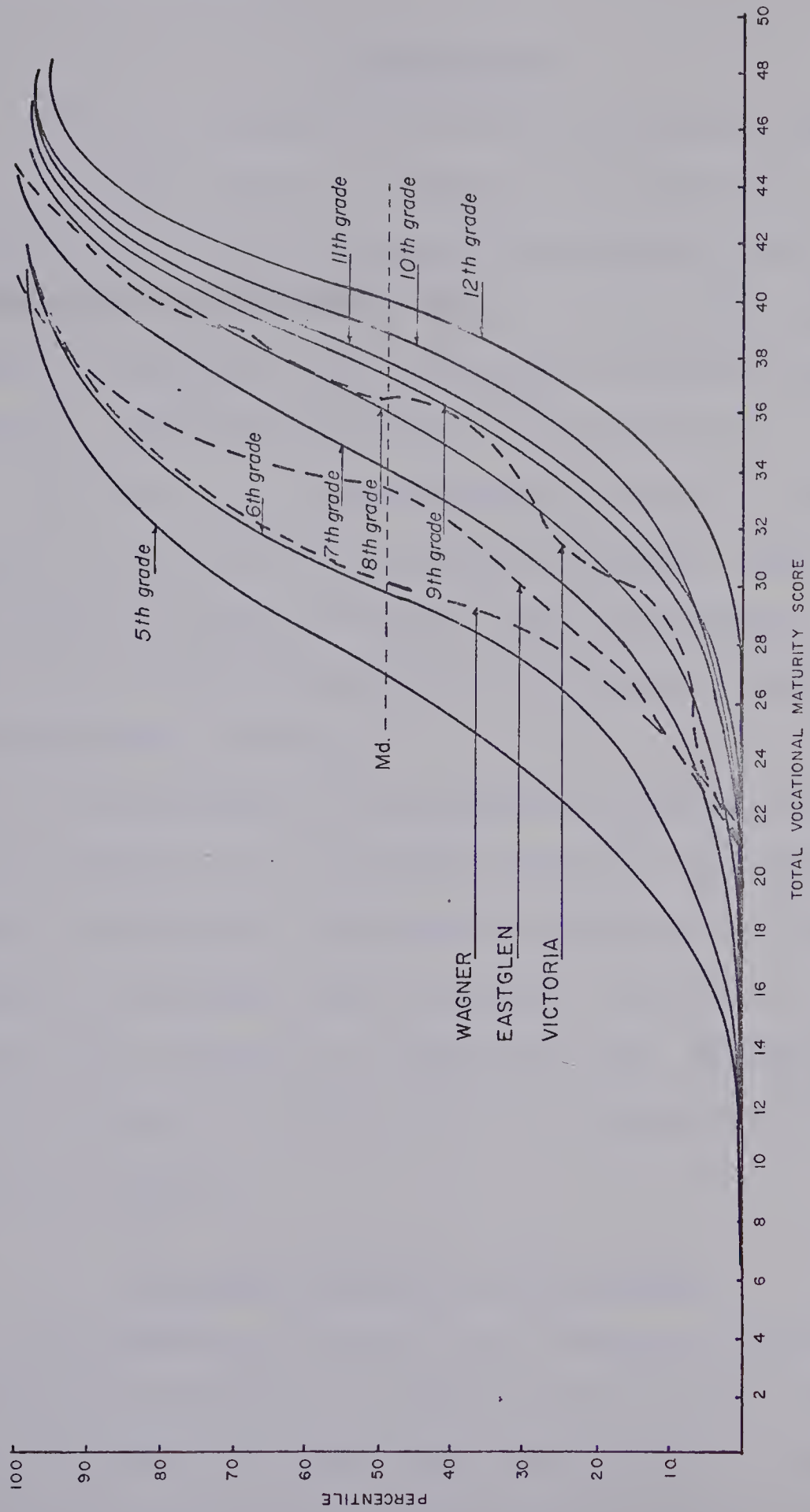


Fig. 7. Cumulative percentage ogives of total VM scores for Wagner, Eastglen (failures) and Victoria vs Iowa (Crites, 1965a, p. 25) grades 5 through 12.

eleventh grade ogives.

Conclusions

Three conclusions are developed from the study:

1. With respect to maturity of vocational attitudes, the Wagner first year group and the Eastglen grade nine failure group, particularly males, are generally alike, whereas the Victoria 12/22 vocational-technical group is different. The Victoria group is more mature.

2. There is a preponderance of males in the programs. In terms of maturity of vocational attitudes, the range of group levels is wider for males than for females. The females in the programs generally represent a smaller and more homogeneous grouping.

3. The results of the investigation show ascending levels of maturity of vocational attitudes for Wagner to Eastglen to Victoria. In terms of maturity of vocational attitudes, the groups least ready for the world of work are first year students at Wagner and male students in the first year group at Wagner and in the grade nine failure program at Eastglen.

Elements of Error in the Study

Two elements of error in the study are considered. As indicated in Chapter 3, sample returns were treated as samples for data processing and data analysis. The error in so doing was deemed insignificant for sample returns of

49 of 50 for the Wagner first year group, 35 of 36 for the Eastglen failure group, 20 of 20 for the Eastglen pass group and 49 of 50 for the Victoria 12/22 vocational-technical group.

The second element of error was in the definition of populations. By using fall directories for a study which was carried out in the spring, a follow-up task was necessary. Attrition experience for each sample is recorded in Appendix C.

If related studies are contemplated, careful consideration should be given to defining populations. By using fall directories of schools operating on a ten month year, the data collection task would probably include a follow-up procedure if the study were conducted the following spring. By using in-school students only, the data collection task would be simplified and sample returns would more likely correspond to samples.

By defining the term student as an in-school person the study would relate more closely to the definition in the Crites study. In directions to students on VDI Form IV is the sentence: "Occupational choice means the kind of job or work that you think you will probably be doing when you finish all of your schooling." In statements about occupational choice and work listed in the VDI booklet (Appendix A) it is implied that the students are unemployed. Examples of such statements are items 6, 40 and 41 of the

VDI booklet.

With exception of two error elements which have been described the design of the study was considered appropriate for making the decisions reported in Chapter 5.

Role of the Eastglen Pass Group

The finding in the study that there was no significant difference between maturity of vocational attitudes scores of E(F) and E(P) allowed the limiting of the study to the grade nine failure group. The probability of likeness of the two groups in the certificate program suggested that the school had applied effective means of grouping students. As reported by the school the grouping procedure consisted of selecting all grade nine failure students and placing them with all grade nine pass students with low marks in mathematics or science. Had the E(F) and E(P) samples been significantly different, the Eastglen groupings for the certificate program could have been questioned. Had E(F) been representative of E(F) only and not of the certificate group, the design of the study would have been changed.

Need for Further Studies

An immediate in-depth study of the certificate program at Eastglen is suggested. The study could relate maturity of vocational attitudes scores to success at school and/or to employment. A re-testing for maturity of

vocational attitudes two years hence, at the grade 12 level, would be of interest. The follow-up would be significant in terms of holding power of the Eastglen certificate program, and in observing changes in attitudes of the sample as it became two years older.

Further use should be made of the collected data. A long-term follow-up study could indicate which students tend to drop out of school--those with low maturity of vocational attitudes scores or those with high maturity of vocational attitudes scores. There is need to know patterns of employment of dropouts. Have such students made decisions to apprentice or to enter other specific types of occupations? Do they tend to move haphazardly from job to job or do they remain unemployed if they have high scores or if they have low scores?

Crites reported that verbal vocational behaviors are monotonically related to both age and grade, but are more frequently associated with the latter than the former (Crites, 1965a, p. 1). Although grades in Crites' study may not be identical to grades in Alberta, this statement was of significance to this study in that the ogives for samples placed the samples in a near-graded sequence of 6+, 7-, 9. The sequence was observed although two of the groups were drawn from a semi-graded situation. Because samples were drawn from first year groups only, there was no attempt to study the relationship of age to maturity of

vocational attitudes score. The collected data could be re-examined for correlations of age and score in the development of a parallel study.

The study indicated a trend away from gradedness in schools and a move toward other ways of grouping students. Reference was made in Chapter 1 to a Cairns program (Appendix G), a Wagner program, a certificate program and a 12/22-32 vocational-technical program. These are a few of the programs in a district which may be moving towards an integrated kindergarten to grade twelve (K to 12) system. A further study would be useful to identify all programs in such a system. The outcome could be an operational model for curriculum development in the district.

Without specific consideration of age or grade in the study, the identification of a 6+, 7-, 9 sequence suggests a continuum of maturity of vocational attitude levels for students moving away from the traditional academic stream. The possibility of such a continuum could be explored further in the Edmonton public school district by extending the study to include students of the L. Y. Cairns Vocational School. Should the existence of such a continuum be so indicated there would be implications for the district as it becomes more involved with its K to 12 model. The ideas of streams, of patterns and of an integrated system would come more sharply into focus. It could have the effect of an examination of the role of a

public educational system in a community.

The study indicated that student groups of two significantly different maturity levels were identified in three programs. First year students at Wagner and certificate program students at Eastglen appeared to be alike whereas the Victoria 12/22 vocational-technical group appeared to be different. Apparently, the same pattern existed for males of these groups, but not for females. For females, the Eastglen group was not significantly different from the Wagner group or the Victoria group.

If administrative actions were taken on these bases then it would seem possible that these Eastglen girls could successfully transfer to Victoria or to Wagner. Similarly the Eastglen boys of the certificate program could then successfully transfer to Wagner but not to the 12/22 vocational-technical program at Victoria. A follow-up of all transfers from the Eastglen certificate program could be useful in examining the outcomes of administrative action involving such transfers.

Because the Wagner first year group and the Eastglen failure group were somewhat alike in terms of maturity of vocational attitudes, relationships of these groups with junior high schools come into focus. Questions arise with respect to identification and selection of students. Which grade eight students enter grade nine with the prospect of low achievement during the ensuing year? If the grade

eight student subsequently fails grade nine, will he or she have wasted a year? If the student enters grade nine and subsequently fails grade nine, what senior high school program should be available? What are the assumed responsibilities of the district in developing programs at the Eastglen certificate level?

A descriptive study would be helpful to the district in examining the magnitude of the problem. Without reliable data there is the possibility that the situation could deteriorate to the point of disservice to students.

From the cumulative percentage ogives of the total maturity of vocational attitudes scores (Chapter 5), there was indication of a 6+, 7-, 9 sequence for the Wagner first year group, the Eastglen grade nine failure group and the Victoria 12/22 vocational-technical group. The sequence could have been 7, 8, 9 or 8, 9, 10 or 9, 10, 11 had there been a direct grade relationship for the Wagner first year group and grade nine, for the Eastglen grade nine failure group and grade ten and for the Victoria 12/22 vocational-technical group and grade eleven. Without maturity of vocational attitudes norms for the Alberta secondary school population or for grades five through twelve of the Edmonton public school system, it would be difficult to say why the 6+, 7-, 9 sequence is indicated. Without Alberta norms there is no basis for saying that the Victoria 12/22 vocational-technical group is two grades in advance of the

Eastglen grade nine failure group and three grades in advance of the Wagner first year group, or that one group is more disadvantaged than another.

The ogives for Eastglen and Victoria appear irregular as compared with those of the Crites study and of Wagner. Whether small samples or scores for female subgroups contributed to non-conformity would be subjects for further study.

On the basis that the study included girls taking business education courses at Wagner and at Eastglen but excluded girls in the business education program at Victoria, it would be of interest at Victoria to compare maturity of vocational attitudes levels of girls in the business education program with girls in the vocational-technical program. Such a study would help to describe existing relationships of these two programs for girls in a comprehensive high school.

Statements have been made with respect to additional studies in the field of maturity of vocational attitudes of students in vocational programs. To complete the chapter and the study, three major recommendations for additional studies are presented.

Recommendations

1. That a sampling of junior high schools of the Edmonton public school system implement the use of the

Vocational Development Inventory instrument in regular counseling services for all students in their respective schools.

Rationale. The sampling of schools would allow inclusion of new suburban schools and older inner-city schools. It would allow for inclusion of different socio-economic categories of students. There could be immediate application of test results through an on-going study: (a) of maturity of vocational attitudes for all students identified and selected for the Wagner program, (b) of students selected for the Wagner program from participating schools and from non-participating schools, (c) of students entering certificate type programs in senior high schools, (d) of student withdrawals from secondary schools of the system, (e) of students entering senior high school programs such as business education, matriculation, general, fine arts and vocational-technical education. In course of time the study could be extended to the special education field, particularly where articulation of Cairns and Wagner programs was desirable..

2. That an extensive follow-up study program of the Eastglen grade nine failure group be conducted for five years.

Rationale. The study would be manageable with 35 students and it would have implications beyond the Eastglen grade nine failure group to all certificate type program students.

A cumulative experience report for the Eastglen grade nine failure group over a five year period would serve as a control for administrative decisions until such time as a larger study could provide more guidance.

The 35 students were willing to participate in the initial study and would probably consider participation on a long term basis, particularly if inconvenience pay were offered.

3. That a program be conducted by counselors in all junior and senior high schools to test maturity of vocational attitudes of students withdrawing from the school system.

Rationale. Such a program would provide one basis for follow-up studies of students who withdraw from school. It would also provide data to measure relationships of maturity of vocational attitudes and proneness to withdraw.

Three studies as outlined above could be the initial stages of involvement in a developmental program such as the Vocational Development Project.

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APPENDIX A

Vocational Development Project

University of Iowa

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The Vocational Development Project at the University of Iowa

What occupations do young people choose? How and why do they choose them? What are their attitudes toward choosing an occupation? Are these attitudes related to the realism of their choices? Do their attitudes and choices change as they grow older? These and related questions about the career choices of children, adolescents, and youth are the main concern of the Vocational Development Project at the University of Iowa, Iowa City, Iowa. Established by a grant from the U.S. Office of Education and sponsored by the Cooperative Research Program, the Vocational Development Project is designed to gather information on the vocational maturity of boys and girls at all levels of the educational system, from the elementary grades to the college years. The primary purpose of the study, which will extend over a period of three years, is to gain a greater understanding of the decisions which young people make at different stages in their development and how these decisions are related to their subsequent success and satisfaction in work.

From the study of interview conversations and test results, it is hoped that valuable knowledge will be gained about vocational decision-making which can be used by parents to guide their children toward more satisfying careers and which can be drawn upon by guidance counselors and teachers to improve the occupational orientation of their students. Too often boys and girls make poor decisions about their future work early in their lives which are difficult to change later on. If, as parents and counselors and teachers, we knew what mistakes they were making as children we might be able to help them avoid as adolescents and adults many of the problems, such

as low grades and job dissatisfaction, which result from unrealistic vocational choices. Through the cooperation of many parents and school personnel, the Vocational Development Project has already identified some of the difficulties which young people have in selecting a wise occupational goal and has initiated studies of what the factors are which produce them.

With the participation of other school systems, technical training institutes, and colleges and universities throughout the country, it should be possible for the Vocational Development Project to accomplish several goals. First, a meaningful and practical inventory of a young person's vocational maturity, which can be used in career counseling, can be constructed and tried out. Second, data on the stages and trends which take place in vocational development over periods of years can be collected and analyzed. Third, the relationship of vocational development to other aspects of an individual's development, such as the emotional, intellectual, and social, can be investigated. And, fourth, the effectiveness of guidance and counseling facilities in the schools can be appraised and possibly increased in light of new facts on how and why students choose occupations as they do. Other objectives may also be achieved, but these seem to be the most important ones at present for studying and understanding how boys and girls develop vocationally.

For those who are interested in additional information on the current activities and future plans of the Vocational Development Project or in participating in one of its studies write to:

Dr. John O. Crites
University Counseling Service
University of Iowa
Iowa City, Iowa

THE UNIVERSITY OF IOWA

IOWA CITY, IOWA 52240



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Department of Psychology

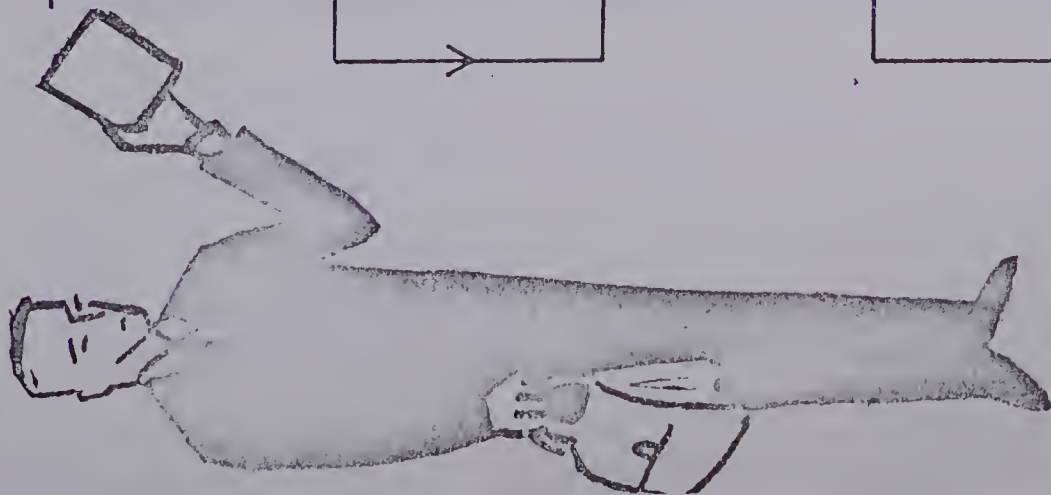
May 2, 1969

Mr. G.A. Sanders
University of Alberta
14607 87 Avenue
Edmonton 51 Alberta CANADA

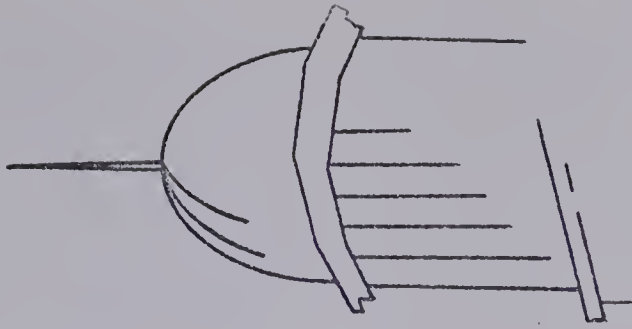
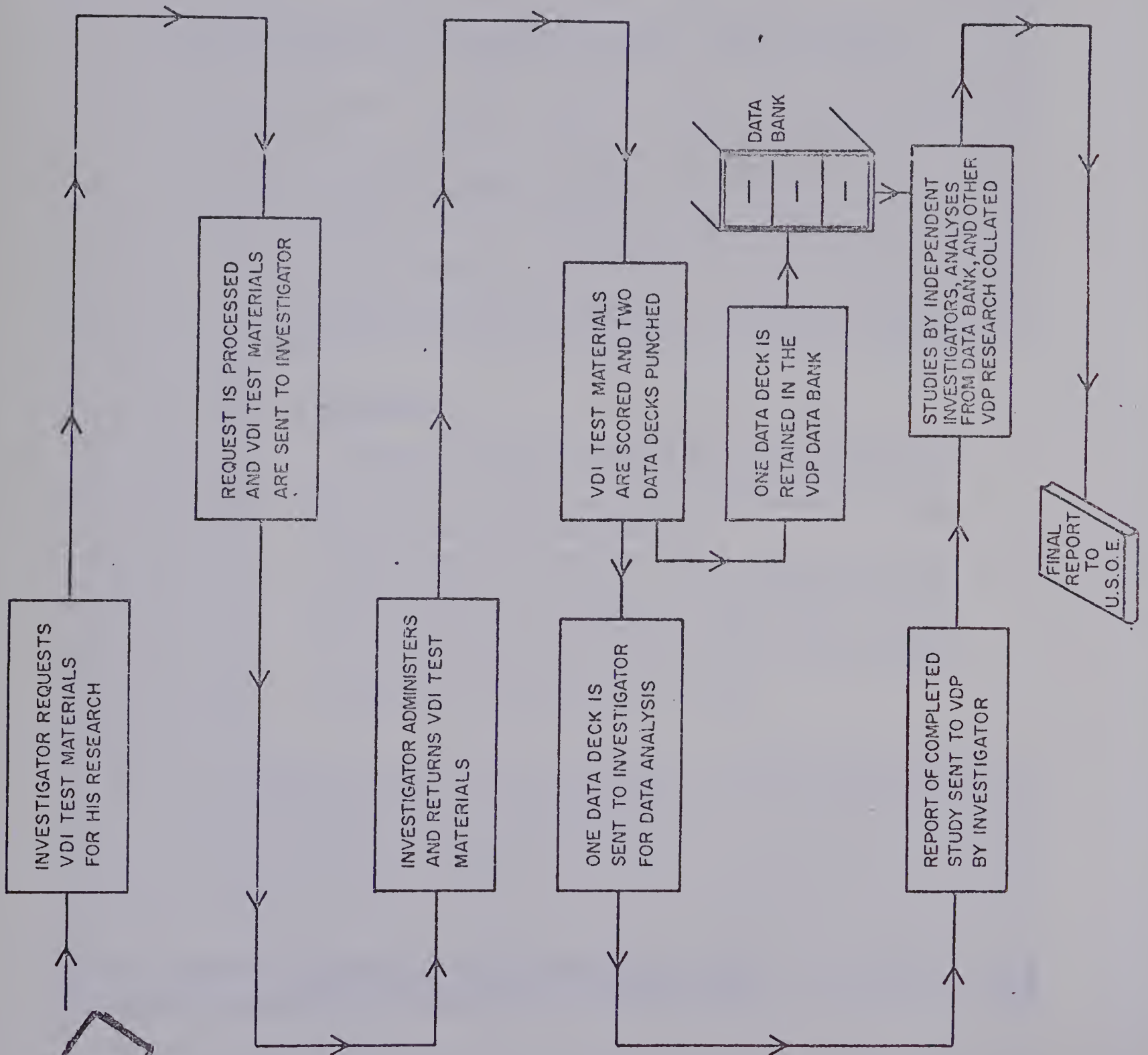
Dear Mr. Sanders

I am sending ~~under separate cover~~ the 60 VDI test booklets and the 200 VDI answer sheets which you requested. When you distribute them, please instruct your Subjects to use a soft #2 pencil, not a pen. When you have finished your testing, please mail the answer sheets to us for scoring. Be certain that they are in good condition to be stored; do not staple other papers to them. Also, pack the test materials well so that they will not be damaged in shipment. Since students often erase, it will be helpful to check the accuracy of the information blocks for careless mistakes before sending the answer sheets to us for scoring.

Enclosed for your use and information are (1) instructions for mass administration which can be used with large groups or over an intercom system and (2) the card layout for the data deck you will receive from the scored answer sheets. If you have any questions concerning these materials or the VDI, I shall be happy to try to answer them. Good luck in your study.



INDEPENDENT
INVESTIGATOR



VOCATIONAL DEVELOPMENT
PROJECT AT THE UNIVERSITY
OF IOWA

Vocational Development Inventory

Attitude Scale

JOHN O. CRITES, Ph.D.
THE UNIVERSITY OF IOWA

DIRECTIONS:

There are a number of statements about occupational choice and work listed in this booklet. Occupational choice means the kind of job or work that you think you will probably be doing when you finish all of your schooling.

If you agree or mostly agree with the statement, use your pencil to blacken the circle in the column headed *T* on the separate answer sheet. If you disagree or mostly disagree with the statement, blacken the circle in the column headed *F* on the answer sheet. Be sure your marks are heavy and black. Erase completely any answer you wish to change.

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FORM T FOR RESEARCH PURPOSES ONLY

Part I

1. Once you choose a job, you can't choose another one.
2. In order to choose a job, you need to know what kind of person you are.
3. I plan to follow the line of work my parents suggest.
4. I guess everybody has to go to work sooner or later, but I don't look forward to it.
5. A person can do any kind of work he wants as long as he tries hard.
6. I'm not going to worry about choosing an occupation until I'm out of school.
7. Your job is important because it determines how much you can earn.
8. Work is worthwhile mainly because it lets you buy the things you want.
9. The greatest appeal of a job to me is the opportunity it provides for getting ahead.
10. I often daydream about what I want to be, but I really haven't chosen a line of work yet.
11. Knowing what you are good at is more important than knowing what you like in choosing an occupation.
12. Your parents probably know better than anybody which occupation you should enter.
13. If I can just help others in my work, I'll be happy.
14. Work is dull and unpleasant.
15. Everyone seems to tell me something different, until now I don't know which kind of work to choose.
16. I don't know how to go about getting into the kind of work I want to do.
17. Why try to decide upon a job when the future is so uncertain.
18. I spend a lot of time wishing I could do work that I know I cannot ever possibly do.
19. I don't know what courses I should take in school.
20. It's probably just as easy to be successful in one occupation as it is in another.
21. By the time you are 15, you should have your mind pretty well made up about the occupation you intend to enter.
22. There are so many things to consider in choosing an occupation, it is hard to make a decision.
23. I seldom think about the job I want to enter.
24. It doesn't matter which job you choose as long as it pays well.

25. You can't go very far wrong by following your parents' advice about which job to choose.
26. Working is much like going to school.
27. I am having difficulty in preparing myself for the work I want to do.
28. I know very little about the requirements of jobs.
29. The job I choose has to give me plenty of freedom to do what I want.
30. The best thing to do is to try out several jobs, and then choose the one you like best.
31. There is only one occupation for each person.
32. Whether you are interested in a particular kind of work is not as important as whether you can do it.
33. I can't understand how some people can be so set about what they want to do.
34. As long as I can remember I've known what kind of work I want to do.
35. I want to really accomplish something in my work—to make a great discovery or earn lots of money or help a great number of people.
36. You get into an occupation mostly by chance.
37. It's who you know, not what you know, that's important in a job.
38. When it comes to choosing a job, I'll make up my own mind.
39. Choose an occupation which gives you a chance to help others.
40. When I am trying to study, I often find myself daydreaming about what it will be like when I start working.
41. I have little or no idea of what working will be like.
42. Choose an occupation, then plan how to enter it.
43. I really can't find any work that has much appeal to me.
44. Choose a job in which you can someday become famous.
45. If you have some doubts about what you want to do, ask your parents or friends for advice and suggestions.
46. Choose a job which allows you to do what you believe in.
47. The most important part of work is the pleasure which comes from doing it.
48. I keep changing my occupational choice.
49. As far as choosing an occupation is concerned, something will come along sooner or later.
50. Why worry about choosing a job when you don't have anything to say about it anyway.

ATTITUDE SCALE

T	F	T	F	T	F	T	F
1		14		27		40	
2		15		28		41	
3		16		29		42	
4		17		30		43	
5		18		31		44	
6		19		32		45	
7		20		33		46	
8		21		34		47	
9		22		35		48	
10		23		36		49	
11		24		37		50	
12		25					
13		26		39			

F	F	T	F	T	F	T	F
1	○	14	○	27	○	40	○
2	○	15	○	28	○	41	○
3	○	16	○	29	○	42	○
4	○	17	○	30	○	43	○
5	○	18	○	31	○	44	○
6	○	19	○	32	○	45	○
7	○	20	○	33	○	46	○
8	○	21	○	34	○	47	○
9	○	22	○	35	○	48	○
10	○	23	○	36	○	49	○
11	○	24	○	37	○	50	○
12	○	25	○	38	○		
13	○	26	○	39	○		

[illegible][illegible][illegible]

VDI Instructions Sheet

Today's test will begin in a couple of minutes. Will the teachers please distribute the test materials.

To begin the testing, fill in the following information on side 1 of the answer sheet. Please use pencils only. First, print your occupational choice on the lines provided under the question "What occupation do you plan to enter?" If you are undecided, then put undecided in this space.

Now turn your answer sheet sideways and in the boxes where it says "Name", first print your last name, skip a space, then your full first name; skip a space, and your middle initial. If there are not enough boxes to fill in your full first name, just fill in as much as possible. Next, carefully blacken the circles with the letters in them which correspond to those in the boxes above. For the boxes you have left blank, blacken the empty circles which are right below the boxes.

Now, blacken the circle indicating your sex, male or female.

Next, print your month, date and year of birth in the boxes provided and blacken in the appropriate circles. Consult the chart below the circles, if necessary, to code the month of birth. Now fill in your age in years.

Next, fill in your grade by blackening the appropriate circles in the columns headed "GR".

In the spaces under Test Date, fill in today's date (give date) and in the spaces headed "School" code in your school code which is:_____.

Now turn your answer sheet so that it is lengthwise again and then read the directions on your test booklet silently while I read them aloud. (Read directions from booklet.)

Work rapidly, but carefully. Now go ahead and complete the inventory. (Allow 20 minutes for test.)

About 3 minutes before the end of the testing period say-- "The testing period will end in about 3 minutes. Please try to finish the test in that time, if you haven't already done so. When the testing is completed, will the teachers please collect the test booklets and answer sheets separately. Place both the test booklets and answer sheets in the manila envelope along with the unused materials. Then place your name, grade and homeroom number on the outside and return the packet to the counselor's office. Thank you all for your cooperation.

Instructions for Reading VDI Data Cards - Format 5

<u>Column</u>	<u>Description</u>	
1	Card type	0=longitudinal 1=cross sectional
2	Pass (card) number	1 or 2 for cross sectional (2 cards); part of name block for single longitudinal card
3-17	Name	
18	Sex	Coded 5=male 6=female
19-22	Age	2 col. for months, 2 col. for years as of test date
23-24	Grade	In school; not applicable for non students
25-28	Test date	2 col. for month, 2 col. for year
29-30	School	Coded in some studies; not required for most studies
31	Test form	IV
32-34	Iowa Test of Educational Development score (ITED)	
35-40	Dictionary of Occupational Titles code (DOT)	
41-42	Anne Roe's Occupational Classification code (ROE)	
43-50	Other information such as special I.D. numbers, etc.	
51	Blank	
52-53	Vocational maturity score (VM)	
54	Blank	
55-80	Items (cross sectional only)	1-25 on cross sectional pass 1 26-50 on cross sectional pass 2 Blank for longitudinal - no items
	coded	1=true 3=false

NOTE: Read numbers by scanning punched holes in appropriate column; print-out at top of card does not correspond to punches.

CRITES-VDI-FORMAT 5

[illegible]

Only 1 longitudinal card;
col. I will be 0

May 14, 1969.

M E M O R A N D U M

TO: Technical Teachers

FROM: T. R. Bryce

We are assisting Mr. Sanders to do a Vocational Development Inventory. Your co-operation in the following would be appreciated.

1. Administer the test exactly as indicated on the accompanying information sheet.
2. Students should not mark the booklet.
3. Only side 1 of the answer sheet is to be completed, with the exception of part 2. Do nothing with side 2.
4. Please administer the test Thursday and return all completed materials as soon as possible. Have absent students complete theirs immediately upon returning.

Thank you.

TRB/t

14606 87 Avenue
Edmonton 51, Alberta
November 13, 1969

Dr. John O. Crites,
Vocational Development Project Director
Department of Psychology
The University of Iowa
Iowa City, Iowa 52240

Vocational Development Inventory Materials

My study which uses the Vocational Development Inventory is nearly complete.

I seek permission to Xerox sufficient copies of relevant Vocational Development Inventory and Vocational Development Project materials to put into twelve books which I expect to bind. The following items should be included:

VDI--Attitude Scale

VDI--Answer Sheet, side 1

Instructions for Administration

Instructions for Reading VDI Data Cards--Format 5

Card Format Form

Open Letter re VDP

Letter, May 2, 1969 from Dr. John O. Crites

Schedule for Independent Investigator

Your permission to proceed with duplicating these materials will be appreciated. Each copy will be marked according your instructions.

THE UNIVERSITY OF IOWA

IOWA CITY, IOWA 52240



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University Counseling Service

November 26, 1969

Mr. G.A. Sanders
14607 87 Avenue
Edmonton 51, Alberta, Canada

Dear Mr. Sanders:

You have my permission to reproduce the VDI material you mentioned in your letter for the purpose of putting them in what I assume are copies of your dissertation. If you have an additional copy of your study, I would appreciate your sending me one. I know you must be happy to have completed your research, and I wish you success in your future career.

I have enclosed a copy of a report on the Vocational Development Project which has just been completed. It summarizes the research which we have done here as well as that which was conducted elsewhere. I hope it will provide you with an over view of the project.

APPENDIX B

Grade IX Stanine Letter Distribution

Edmonton Public School Board

September, 1966

Edmonton Public School Board

September 1966

Grade IX Stanine-letter Distribution

(6 subjects)

1	2	3	4	5	6	7	8	9
4	7%	12%	17%	20%	17%	12%	7%	4
D		C		B	A		H	
10%		30%		25%	25%		10%	

Stanine

Letter Grading
Subject Distribution

APPENDIX C

Testing Events Calendars

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Testing Events Calendar for Victoria Sample	109

Coding for Testing Events Calendars, 1969

Code

CS	Completed at school
CH	Completed at home
CT	Completed by telephone
CRL	Completed by registered letter
RL	Registered letter sent
L	Letter sent
UN	Unsuccessful attempt to contact or complete
IS	Incomplete, but student at school
DNC	Did not complete

Calendars

The testing events calendars for Wagner, Eastglen and Victoria are displayed on pages 105 to 110. Code designations on the calendars describe activities associated with each testing event.

Testing Events Calendar for Wagner Sample

May 15, 1969 to July 9, 1969

Student	Events
1	May 20 IS, July 5 CT
2 ^a	May 26 CS
3	May 28 UN, June 9 UN, June 15 UN, June 19 UN, CH
4 ^a	May 20 CS
5	May 26 CS
6	May 20 CS
7	May 20 CS
8	May 26 CS
9	May 28 UN, May 29 CH
10	May 28 CH
11	May 20 CS
12	May 20 CS
13 ^a	May 26 CS
14	June 13 CS
15 ^a	May 20 CS
16	June 13 UN, June 20 UN, June 23 CH
17	May 20 CS
18	May 28 UN, June 8 UN, June 9 UN, July 2 UN, July 7 UN, RL, DNC
19	May 20 CS
20 ^a	May 28 UN, June 15 UN, June 18 UN, June 23 CH
21 ^a	May 20 CS
22 ^a	May 28 UN, June 9 UN, June 15 UN, June 17 UN, July 5, UN, July 7 UN, RL, July 9 CRL
23	May 20 CS
24	May 20 CS
25	May 20 CS
26	May 20 CS
27	May 20 CS
28	May 26 CS
29 ^a	May 20 CS
30 ^a	May 26 CS
31	May 28 UN, June 9 UN, CH
32	May 26 CS
33	May 26 CS
34 ^a	May 26 CS
35	May 20 CS

^aFemale

Testing Events Calendar for Wagner Sample (Continued)

May 15, 1969 to July 9, 1969

Student	Events
36 ^a	May 20 CS
37 ^a	May 20 CS
38	May 20 CS
39	May 20 CS
40 ^a	May 20 CS
41	May 20 CS
42	May 20 CS
43 ^a	May 26 CS
44 ^a	May 20 CS
45	May 20 CS
46 ^a	May 20 CS
47	May 20 CS
48	May 20 CS
49	May 20 CS
50 ^a	May 28 UN, June 3 UN, June 9 UN, June 10 CH

^aFemale

Testing Events Calendar for Eastglen Grade Nine Failure Sample

May 15, 1969 to July 9, 1969

Student	Events
1	May 15 CS
2	June 3 UN, June 5 UN, June 10 CS
3 ^a	May 15 CS
4 ^a	May 15 CS
5 ^a	June 2 UN, June 3 CH
6 ^a	May 15 CS
7 ^a	May 15 CS
8 ^a	May 15 CS
9	May 15 CS
10	June 3 UN, June 4 CH
11 ^a	May 15 CS
12	May 15 CS
13 ^a	May 15 CS
14	June 3 CH
15	May 15 CS
16	May 15 CS
17	May 15 CS
18	June 3 UN, June 4 UN, June 9 CT
19 ^a	May 15 CS
20	May 15 CS
21 ^a	June 4 UN, June 5 CS
22	May 15 CS
23	May 15 CS
24 ^a	May 15 CS
25	May 15 CS
26	May 15 CS
27 ^a	May 15 CS
28 ^a	June 3 CH
29	May 15 CS
30	May 15 CS
31 ^a	May 15 CS
32 ^a	June 3 UN, June 4 UN, June 8 UN, June 9 UN, June 10 UN, DNC
33	May 15 CS
34	May 15 CS
35	May 15 CS
36 ^a	May 15 CS

^aFemale

Testing Events Calendar for Eastglen Grade Nine Pass Sample

May 15, 1969 to July 9, 1969

Student	Events
1	May 15 CS
2	May 15 CS
3	May 15 CS
4	June 8 UN, June 12 CH
5	May 15 CS
6 ^a	May 15 CS
7 ^a	May 15 CS
8	May 15 CS
9	May 15 CS
10	May 15 CS
11 ^a	May 15 CS
12	May 15 CS
13	May 15 CS
14	May 15 CS
15 ^a	May 15 CS
16 ^a	May 15 CS
17	May 15 CS
18 ^a	May 15 CS
19 ^a	May 15 CS
20	June 3 UN, June 5 CS

^aFemale

Testing Events Calendar for Victoria Sample

May 15, 1969 to July 9, 1969

Student	Events
1	May 15 CS
2	May 15 CS
3	June 9 UN, June 12 UN, June 16 UN, June 24 CH
4	May 15 CS
5	June 9 UN, June 12 UN, CH
6	May 15 CS
7 ^a	May 15 CS
8	May 15 CS
9 ^a	June 8 UN, June 17 UN, RL, DNC
10	May 16 CS
11	May 15 CS
12	May 20 CS
13	May 15 CS
14 ^a	June 9 CT
15	May 15 CS
16	May 15 CS
17 ^a	June 17 UN, June 23 CH
18 ^a	June 9 UN, June 12 UN, June 16 UN, June 18 CH
19 ^a	May 15 CS
20	May 15 CS
21	June 17 UN, June 25 UN, June 26 CH
22	June 9 UN, June 25 UN, July 2 CH
23 ^a	June 18 UN, June 25 CS
24 ^a	May 21 CS
25	May 15 CS
26	May 16 CS
27	May 15 CS
28	June 8 UN, June 9 UN, June 12 UN, June 16 CH
29 ^a	May 15 CS
30 ^a	June 18 UN, June 25 UN, June 26 UN, June 27 CH
31	May 15 CS
32	May 16 CS
33	May 15 CS
34	May 20 CS
35	May 16 CS
36	May 15 CS

^aFemale

Testing Events Calendar for Victoria Sample (continued)

May 15, 1969 to July 9, 1969

Student	Events
37	May 15 CS
38	May 15 CS
39	May 15 CS
40	June 9 UN, June 12 UN, June 16 CH
41	May 15 CS
42	June 9 UN, June 10 UN, June 17 CS
43 ^a	June 15 UN, June 17 L, June 18 UN, June 23 CH
44	June 5 CS
45 ^a	May 15 CS
46	May 15 CS
47 ^a	May 21 CS
48	May 15 CS
49 ^a	June 9 UN, June 17 UN, L, July 7 RL, July 9 CRL
50	June 9 UN, June 17 UN, RL, June 23 UN, June 24 CH

^aFemale

APPENDIX D

Computer Programs used in the Study

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DESTØ6 June 1968: DESCRIPTIVE STATISTICS PACKAGE WITH DATA TRANSFORMATION	113
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ANOV 15 June 1968: ONE-WAY ANALYSIS OF VARIANCE .	117

UNIVERSITY OF ALBERTA

DESTØ6
June 1968

Division of Educational Research Services

Computer Program Documentation

TITLE: DESCRIPTIVE STATISTICS PACKAGE WITH DATA
TRANSFORMATION

MACHINE: IBM 360/67

LANGUAGE: FORTRAN IV.

PROGRAM TYPE: COMPLETE

SUBPROGRAMS: CORREL, BLNKCK, PRLN, FREQ, TABLE, CHIPRB,
CHINOR, GAUSS, PLOT, SUMRCI, PRNTUP, GSINV,
DATRAN

LIMITS: Dimensioned for 90 variables and 4500
observations. Disks or tapes are required
for temporary storage on drives 1, 3 and 4.

PROGRAMMED/
DOCUMENTED BY: S. HUNKA, D. PRECHT

Description

This program will calculate means, standard deviations, correlations, ranges, measures of skewness, kurtosis and chi-square goodness of fit to the normal curve. Observed frequency distributions and expected frequency distributions based on a normal curve along with histograms of the frequency distributions are also output. Optional output includes: scatter diagrams which plot selected pairs of variables against each other, transformation of the data in terms of changing the mean or standard deviation, or in terms of normalizing the data, and a

repetition of the above statistics based on the transformed data. Card output of the transformed scores may be obtained.

References

Ferguson, G. A. Statistical Analysis in Psychology and Education. New York: McGraw-Hill, 1966.

UNIVERSITY OF ALBERTA

ANOV10

June 1968

Division of Educational Research Services

Computer Program Documentation

TITLE: T-TESTS WITH TESTS ON VARIANCES AND WELCH APPROXIMATIONS.

MACHINE: IBM 360/67

LANGUAGE: FORTRAN IV (H).

PROGRAM TYPE: COMPLETE.

SUBPROGRAMS: DATRAN, PLEVEL, PROBLY, BTALOB, BASHLN, GAMLOG, DFPRINT.

LIMITS: 100 variables.

PROGRAMMED/
DOCUMENTED BY: J. CARLSON, C. HAZLETT.

Description

1. "t" values (and their probability levels) between two samples are calculated using the formula for "t" tests between independent samples, with or without missing data.
2. F ratios (and their probability levels) for the differences between sample variances are given.
3. For variables which have unequal variances Welch's approximation to "t" is calculated.
4. Correlations are given for the total group if there is no missing data.

References

Ferguson, G. A. Statistical Analysis in Psychology

and Education. New York: McGraw-Hill, 1966.
Pp. 167-169, 172-173.

UNIVERSITY OF ALBERTA

Division of Educational Research Services

Computer Program Documentation

TITLE: ONE-WAY ANALYSIS OF VARIANCE

MACHINE: IBM 360/67

LANGUAGE: FORTRAN IV (H)

PROGRAM TYPE: COMPLETE

SUBPROGRAMS: HOMOVA, CHIPRB, FISHER, SHEFE, DFPRNT,
NEWKUL, DATRAN

LIMITS: Dimensioned for a maximum of 200 groups and
40 variables.

PROGRAMMED/
DOCUMENTED BY: S. HUNKA, K. S. BAY.

Description

1. This program carries out a standard one-way analysis of variance applying the fixed effect model for equal or unequal observations in each group.
2. Following computations are also included:
 - a. Homogeneity of variance test (Keeping, p. 215).
 - b. Scheffe' multiple comparisons of observed means (Scheffe', p. 68).
 - c. Newman-Keuls comparisons of ordered means (Winer, p. 80).

References

Keeping, E. S. Introduction to Statistical Inference.
New York: Van Nostrand, 1962. P. 214.

Scheffe', H. The Analysis of Variance. New York:
John Wiley, 1964. P. 55.

Winer, B. J. Statistical Principles in Experimental
Design. New York: McGraw-Hill, 1962. P. 48.

APPENDIX E

TABLES 16, 17, and 18

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TABLE 16

Distribution of Wagner (W) VM Scores

121

Interval Number	Interval		Frequency	Cumulative Frequency	Cumulative Percentage
1	20.00	20.47	1.	1	2.04
2	20.47	20.94	0.		
3	20.94	21.41	1.	2	4.08
4	21.41	21.88	0.		
5	21.88	22.35	0.		
6	22.35	22.82	0.		
7	22.82	23.29	0.		
8	23.29	23.76	0.		
9	23.76	24.22	2.	4	8.16
10	24.22	24.69	0.		
11	24.69	25.16	2.	6	12.24
12	25.16	25.63	0.		
13	25.63	26.10	2.	8	16.32
14	26.10	26.57	0.		
15	26.57	27.04	3.	11	22.44
16	27.04	27.51	0.		
17	27.51	27.98	0.		
18	27.98	28.45	5.	16	32.65
19	28.45	28.92	0.		
20	28.92	29.39	6.	22	44.89
21	29.39	29.86	0.		
22	29.86	30.33	1.	23	46.93
23	30.33	30.80	0.		
24	30.80	31.27	6.	29	59.18
25	31.27	31.73	0.		
26	31.73	32.20	5.	34	69.38
27	32.20	32.67	0.		
28	32.67	33.14	3.	37	75.51
29	33.14	33.61	0.		
30	33.61	34.08	2.	39	79.59
31	34.08	34.55	0.		
32	34.55	35.02	4.	43	87.75
33	35.02	35.49	0.		
34	35.49	35.96	0.		
35	35.96	36.43	1.	44	89.79
36	36.43	36.90	0.		
37	36.90	37.37	1.	45	91.83
38	37.37	37.84	0.		
39	37.84	38.31	1.	46	93.87
40	38.31	38.78	0.		
41	38.78	39.24	1.	47	95.91
42	39.24	39.71	0.		
43	39.71	40.18	0.		
44	40.18	40.65	0.		
45	40.65	41.12	1.	48	97.95
46	41.12	41.59	0.		
47	41.59	42.06	0.		
48	42.06	42.53	0.		
49	42.53	43.00	0.		
50	43.00	43.47	1.	49	100.00

TABLE 17

Distribution of Eastglen (E(F)) VM Scores

122

Interval Number	Interval		Frequency	Cumulative Frequency	Cumulative Percentage
1	22.00	22.37	1.	1	2.85
2	22.37	22.73	0.		
3	22.73	23.10	1.	2	5.71
4	23.10	23.47	0.		
5	23.47	23.84	0.		
6	23.84	24.20	1.	3	8.57
7	24.20	24.57	0.		
8	24.57	24.94	0.		
9	24.94	25.31	1.	4	10.28
10	25.31	25.67	0.		
11	25.67	26.04	0.		
12	26.04	26.41	0.		
13	26.41	26.78	0.		
14	26.78	27.14	1.	5	14.28
15	27.14	27.51	0.		
16	27.51	27.88	0.		
17	27.88	28.24	1.	6	17.14
18	28.24	28.61	0.		
19	28.61	28.98	0.		
20	28.98	29.35	4.	10	28.57
21	29.35	29.71	0.		
22	29.71	30.08	0.		
23	30.08	30.45	0.		
24	30.45	30.82	0.		
25	30.82	31.18	2.	12	34.28
26	31.18	31.55	0.		
27	31.55	31.92	0.		
28	31.92	32.29	1.	13	37.14
29	32.29	32.65	0.		
30	32.65	33.02	4.	17	48.57
31	33.02	33.39	0.		
32	33.39	33.76	0.		
33	33.76	34.12	8.	25	71.42
34	34.12	34.49	0.		
35	34.49	34.86	0.		
36	34.86	35.22	4.	29	82.85
37	35.22	35.59	0.		
38	35.59	35.96	0.		
39	35.96	36.33	1.	30	85.71
40	36.33	36.69	0.		
41	36.69	37.06	2.	32	91.42
42	37.06	37.43	0.		
43	37.43	37.80	0.		
44	37.80	38.16	1.	33	94.28
45	38.16	38.53	0.		
46	38.53	38.90	0..		
47	38.90	39.27	1.	34	97.14
48	39.27	39.63	0.		
49	39.63	40.00	0.		
50	40.00	40.37	1.	35	100.00

TABLE 18

Distribution of Victoria (V) VM Scores

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Interval Number	Interval		Frequency	Cumulative Frequency	Cumulative Percentage
1	21.00	21.47	1.	1	2.04
2	21.47	21.94	0.		
3	21.94	22.41	1.	2	4.08
4	22.41	22.88	0.		
5	22.88	23.35	0.		
6	23.35	23.82	0.		
7	23.82	24.29	1.	3	6.12
8	24.29	24.76	0.		
9	24.76	25.22	0.		
10	25.22	25.69	0.		
11	25.69	26.16	0.		
12	26.16	26.63	0.		
13	26.63	27.10	0.		
14	27.10	27.57	0.		
15	27.57	28.04	1.	4	8.16
16	28.04	28.51	0.		
17	28.51	28.98	0.		
18	28.98	29.45	2.	6	12.24
19	29.45	29.92	0.		
20	29.92	30.39	4.	10	20.40
21	30.39	30.86	0.		
22	30.86	31.33	3.	13	26.53
23	31.33	31.80	0.		
24	31.80	32.27	1.	14	28.57
25	32.27	32.73	0.		
26	32.73	33.20	0.		
27	33.20	33.67	0.		
28	33.67	34.14	0.		
29	34.14	34.61	0.		
30	34.61	35.08	3.	17	34.69
31	35.08	35.55	0.		
32	35.55	36.02	6.	23	46.93
33	36.02	36.49	0.		
34	36.49	36.96	0.		
35	36.96	37.43	6.	29	59.18
36	37.43	37.90	0.		
37	37.90	38.37	4.	33	67.34
38	38.37	38.84	0.		
39	38.84	39.31	5.	38	77.14
40	39.31	39.78	0.		
41	39.78	40.24	4.	42	85.71
42	40.24	40.71	0.		
43	40.71	41.18	2.	44	89.79
44	41.18	41.65	0.		
45	41.65	42.12	1.	45	91.83
46	42.12	42.59	0.		
47	42.59	43.06	2.	47	95.91
48	43.06	43.53	0.		
49	43.53	44.00	0.		
50	44.00	44.47	2.	49	100.00

APPENDIX F

Calculations for Differences between Means

Calculations for Differences
Between Means

$$t = \frac{\text{difference between means}}{\sqrt{S^2 \text{ pooled } \left[\frac{1}{na} + \frac{1}{nb} \right]}}$$

Case 1 : W and Crites grade nine group.

$$t = \frac{(36.5 - 30.67)}{\sqrt{\left[\frac{(48 \times 4.67^2) + (701 \times 4.82^2)}{48 + 701} \right] \times \left[\frac{1}{49} + \frac{1}{702} \right]}} = 8.20$$

Case 2 : E(F) and Crites grade ten group.

$$t = \frac{(37.81 - 32.29)}{\sqrt{\left[\frac{(34 \times 4.33^2) + (212 \times 4.58^2)}{34 + 212} \right] \times \left[\frac{1}{35} + \frac{1}{213} \right]}} = 6.65$$

Case 3 : V and Crites grade eleven group.

$$t = \frac{(37.16 - 35.63)}{\sqrt{\left[\frac{(48 \times 5.35^2) + (130 \times 4.72^2)}{48 + 130} \right] \times \left[\frac{1}{49} + \frac{1}{131} \right]}} = 1.87$$

APPENDIX G

L. Y. Cairns Vocational School

L. Y. CAIRNS VOCATIONAL SCHOOL

The school opened in September 1969 and was the first of its kind in the Edmonton public school system. It was designed to accommodate 500 students in a special education setting and offered vocational-academic courses on a six year basis.

The school is an outgrowth of an "opportunity" class program which operated in the system for educable mentally retarded children. In past years students entered the program at 13 years and remained in the junior group for three years. They then advanced to the senior level for another three years. Currently, the L. Y. Cairns Vocational School provides counseling services, special education in reading and service oriented vocational education courses.

The growth of the opportunity class program is proportional to the growth of the public school system. In January 1968 there were 542 opportunity class students in a school district population of 68,636. In January 1969 there were 598 students in a school district population of 71,425. By September 1969 there were 364 students at L. Y. Cairns Vocational School and 295 other opportunity students in the system, for a total of 659 students in a school district population of 74,216.

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